

Udai Pratap Autonomous College, Varanasi



3.4.3 Proof of Paper Publications in Journals

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Curcumin Modulates Paraquat-Induced Epithelial to Mesenchymal Transition by Regulating Transforming Growth Factor- β in A549 Cells

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Abstract— Paraquat (PQ), a widely used potent herbicide, generates superoxide anions and other free radicals, leading to severe toxicity and acute lung injury. PQ induces pulmonary fibrosis through epithelial to mesenchymal transition (EMT) characterized by increased number of myofibroblasts. Time-dependent PQ-induced EMT has been evaluated in present investigation where intracellular ROS levels were significantly enhanced after 24 h of PQ intoxication. Anti-inflammatory effects of curcumin have been studied where alveolar epithelial cells (A549 cells) were incubated with curcumin (30 μ M) for 1 and 3 h before PQ intoxication (700 μ M). Western blot and immunocytochemistry studies revealed that pretreatment of A549 cells with curcumin for 3 h before PQ exposure has maintained E-cadherin expression and inhibited PQ induced α -smooth-muscle actin (α -SMA) expression. Transforming growth factor- β (TGF- β) that seems to be involved in PQ-induced EMT was enhanced after PQ intoxication, but curcumin pretreatment has effectively inhibited its expression. Immunostaining studies have shown that curcumin pretreatment has significantly reduced matrix metalloproteinase-9 (MMP-9) expressions, which were elevated after PQ intoxication. These results demonstrate that curcumin can regulate PQ-induced EMT by regulating the expression of TGF- β .

KEY WORDS: Paraquat; TGF- β ; Matrixmetalloproteinases-9; Fibroblasts and fibrosis.

INTRODUCTION

Paraquat (PQ) is widely used as highly toxic weed killer (herbicide), which can cause multiple organ failure in human and animals [1, 2]. Paraquat poisoning is a major medical problem due to lack of effective treatment. The lung is the principle target organ, and respiratory failure (irreversible lung injury) is the most common cause of death from PQ poisoning because its amount concentrate in lung tissue than any other organ [3–5]. PQ accumulation in lung occurs through type II pneumocytes *via* a polyamine uptake system. The respiratory epithelium is the

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Intranasal curcumin protects against LPS-induced airway remodeling by modulating toll-like receptor-4 (TLR-4) and matrixmetalloproteinase-9 (MMP-9) expression via affecting MAP kinases in mouse model

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Abstract

Objective Bacterial infections can exacerbate asthmatic inflammation depending on lipopolysaccharide (LPS) composition, the outermost component of cell wall, its exposure timings as well as host's immune status. In present study, Balb/c mice were exposed to antigen (ovalbumin) and LPS simultaneously to establish an asthmatic model. Curcumin (diferuloylmethane), well known for its anti-inflammatory potential, was administered through intranasal route 1 h before LPS and OVA (ovalbumin) exposure to evaluate its efficacy against airway structural changes.

Methods Inflammatory cell infiltration in lungs was measured by flow cytometry and further eosinophils were especially measured by immunofluorescence detection of major basic protein (MBP) as marker of eosinophilic granule protein. We also measured reactive oxygen species (ROS) in BALF by spectrofluorometry. MMP-9 activity was evaluated by gelatin zymography and mRNA expressions of MMP-9, TIMP-1, TGF- β 1, IL-13, Collagen-1 and TLR-4 were measured in lungs. Protein expression of MAP kinases (P-ERK, P-JNK, P-p38), TLR-4, Cox-2, Lox-5 and Eotaxin was measured by western blotting. Hydroxyproline level and masson's trichrome staining were used to evaluate collagen deposition in lung.

Results Exposure to LPS (0.1 μ g) exacerbates airway inflammation and induces structural changes in lungs by enhanced ROS production, collagen deposition, expression of genes involved in airway remodeling and activation of MAP kinases pathway proteins. Intranasal curcumin pretreatment had significantly suppressed inflammatory mediators and airway remodeling proteins.

Conclusion Our results strongly suggest that intranasal curcumin effectively protects LPS-induced airway inflammation and structural changes by modulating genes involved in airway remodeling in safer way; hence, it can be considered as supplementary alternative towards asthma treatments.

Keywords Asthma exacerbations · Sensitization · Lipopolysaccharide · Airway remodeling · Collagen

Introduction

Respiratory infections mostly bacterial have dual effect on the asthma pathology as they have been reported to exacerbate as well as protect from ongoing asthmatic inflammation. The hallmark of such exacerbated asthma involves hyper-responsiveness, increased bronchoconstriction and mucous secretion mediated by elevated levels of histamine, platelet activating factors, lipid-derived molecules like prostanoids and leukotrienes C₄ (Dong et al. 2009). We reported earlier that innate immunity plays a central role in deciding phenotype of asthmatic inflammatory response, which was significantly modulated by curcumin. LPS modulates asthmatic

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ICMAM-2018

Synthesis and characterization of PEDOT:PSS/ZnO nanowires heterojunction on ITO coated plastic substrate for light-emitting diodes

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Abstract

In this paper we report on heterojunction between the hole transporting polymer poly (3, 4-ethylenedioxythiophene) polystyrene sulfonate (PEDOT: PSS) and zinc oxide (ZnO) nanowires grown on an indium tin oxide (ITO) coated polyethylene terephthalate (PET) plastic substrate. For the fabrication of heterojunction simple and low cost solution methods are used. The deposited films and heterojunction are characterized by scanning electron microscope (SEM), X-ray diffraction (XRD), photoluminescence (PL) and electroluminescence (EL) measurements. Electroluminescent and photoluminescent spectra of the hybrid heterojunction show one ultraviolet (UV) near-band-edge emission peak. The current-voltage characteristic confirms the junction formation between the polymer and ZnO nanowires and shows good rectifying p-n junction diode type behaviour of the fabricated structure. The charge transfer process in heterojunction is explained by band energy diagram.

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Keywords: ZnO nanowires, PEDOT: PSS, p-n- heterojunction, flexible electroluminescent diode.

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Properties of cementitious systems in presence of nanomaterials

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ABSTRACT

Nanomaterials have shown tremendous applications in different sectors. Nanomaterials of different size and shape when added in small amounts to cementitious systems like cement paste, mortars and concretes, there is an enormous improvements in their properties. Nanomaterials increase mechanical properties, decrease pore size and pore size distribution, modify microstructure, accelerate hydration reactions, increase durability, etc. Effects on the properties of cementitious system have been discussed. The effect of number of nanomaterials like nanosilica, nanocarbon, nanoclay and nano calcium carbonate on the properties of cementitious systems has been discussed.

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Selection and peer-review under responsibility of the scientific committee of the International Conference on Advanced Functional Materials (Innovations in Chemical, Physical and Biological Sciences).

1. Introduction

Nano materials play an important role in construction materials. During the last two decades, nano materials are being used to improve the quality of building materials particularly cementitious materials. Variety of nano materials with different size and shape such as nanosilica, nanoalumina, nano TiO_2 , nano Fe_2O_3 , nanoclay, carbon tubes, graphenes etc. are used to improve rheological and mechanical properties of the cement and concrete. One of the most important hydration products of cement is C-S-H which has nanoscale structure and in the presence of nanomaterials, nucleation and growth of C-S-H phase is enhanced. This enhances the quality of cement and concrete. Many phenomena occurring during hydration can be understood at a nanoscale. Construction can be cheaper, faster, safer, durable and sustainable with nanotechnology. However, technological applications in construction industry, particularly in concretes are still in a very primitive stage and lot of work is still to be done [1]. In this article role of some nanomaterials during the hydration of cement has been reviewed and discussed.

1.1. Portland cement, mortar and concrete

Portland cement is a hydraulic binding material and consists of tricalcium silicate, dicalcium silicate, tricalcium aluminate and

tetracalcium aluminoferrite. In addition it contains 3–5% gypsum. Concrete made from cement is the most economical and valued binding material in construction industry. Paste, mortar, and concrete are represented by Fig. 1.

1.2. Hydration of cement

When water is added to cement, different cement phases hydrate with different speed and the chemical reactions are represented by Fig. 2.

1.3. Effect of nanomaterials on the properties of cementitious systems

NMs change the properties of cement and concrete in number of ways (Fig. 3).

There are a large number of NMs, which change the properties. Some of the important nanomaterials have been discussed below.

1.4. Effect of nanosilica

Nanosilica is a pozzolanic material and when added to cement and concrete, modifies various properties in a positive way [2]. Improvements in the properties of concrete in presence of nanosilica is shown in Fig. 4 [3].

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Ring-opening pathway of 2, 4, 6-trichlorophenol initiated by OH radical: an insight from first principle study

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ABSTRACT

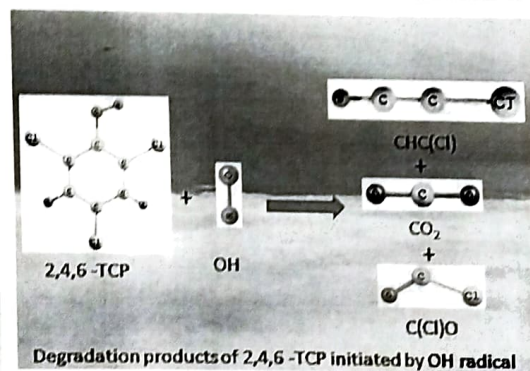
Ring-opening studies of Chlorophenols (CPs) are an important issue to recognise the various end degradation products which may affect the environment and human health. Therefore, here we have explored the ring-opening pathway of 2, 4, 6-trichlorophenol (2, 4, 6-TCP) initiated by OH radical using quantum chemical investigations. Electronic structures and frequencies of all species of the titled reaction are obtained from the density functional theory method using M06-2X functional along with a 6-311++G(d,p) basis set. We have further performed energetic calculations of all optimised species using the CCSD(T) coupled-cluster method combined with the same basis set to achieve more accurate energy values. The full degradation pathway of 2, 4, 6-TCP + [•]OH reaction is shown by potential energy diagram at 298 K and 1 atm. The values of standard enthalpy change ($\Delta_r H^\ominus$) and Gibbs free energy change ($\Delta_r G^\ominus$) of all the reaction steps involved in the ring-opening pathway are also reported herein. From the energy calculations, we found that chloroethyne (HC≡CCl), carbon dioxide (CO₂) and C(Cl)O[•] radical are the end degradation products in the ring-opening pathway.

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KEYWORDS

Chlorophenols; 2,4,6-TCP; ring-opening; OH radicals; DFT



1. Introduction

Chlorophenols (CPs) are one of the important volatile organic chlorides which are widespread in the environment due to the extensive use as preservative agents for wood, paints, vegetable fibres and leather and as disinfectants. Moreover, these are also widely used as herbicides, fungicides and insecticides and as intermediates in the production of pharmaceuticals and dyes [1,2]. Due to broad application in various fields, CPs are emitted

into the upper atmosphere and degraded with various oxidants and thus causing several risks to the human health and environment [3–7]. In this regard, various conventional degradation technologies such as biological treatments, incineration, adsorption over activated carbon, air stripping, etc. have been performed [8–14]. Noteworthy that due to the presence of p-orbital electrons of chlorine atoms and steady conjugation of the aromatic rings, the degradation of CPs by conventional

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**Research Article****USED OF INTERNET AMONG UNDERGRADUATE STUDENTS IN THE COLLEGE OF AGRICULTURE, CENTRAL AGRICULTURAL UNIVERSITY IMPHAL MANIPUR (INDIA)****¹Sureddi Harish Kumar, ¹Daya Ram, ¹Mairenbam Deepa Devi and ²Kamlesh Kumar Goutam**¹College of Agriculture, Central Agricultural University, Imphal-795004, Manipur (India)²Udai Pratap Autonomous College Varanasi, Uttar Pradesh (India)

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Abstract The study was conducted in the College of Agriculture, Central Agricultural University Imphal Manipur during the year 2018-19. In College of Agriculture, Imphal a total number of 265 undergraduate students were enrolled which includes 85 students from 1st Year, 78 students from 2nd Year, 52 students from 3rd Year and 53 students from 4th Year. All of these enrolled undergraduate students from Imphal campus were selected purposively for the study. Out of 265 Undergraduate students, 120 students were selected based on proportionate random sampling for the present study. It was found out of twelve independent variables, only three variables i.e., computer knowledge, family income and father's education were positive and has a significant relationship with the effect of internet utilization among undergraduate students. Among twelve variables, two variables, i.e., computer knowledge and family income were important variables predicting the effect of internet utilization among undergraduate students.

Keywords: Accessibility to Internet, Computer Knowledge, Level of aspiration and Technology.

Introduction

Internet is an integral part of today's Agricultural educational system. Agricultural colleges invest a good deal of amount on providing this facility to both the teachers and students. It is, therefore, essential to find out up to what extent they are utilizing this facility. Today, Agricultural colleges are playing a vital role in imparting technical education. The Agriculturist, who are the outcomes of these colleges, require the latest and pinpointed information in their respective fields. Due to the high cost of Agricultural information resources, developing countries cannot provide these resources to their users. But the Internet with its advantages, make way for the developing countries to access information at a little cost. The adoption of internet facilities into the research, education, and extension are to use the potential of the new information and communication tools to revolutionize an outmoded NARS, to better prepare students and scientists for the information age and accelerate national development efforts. The ever increasing number of people accessing the Internet, coupled with the recent explosion of information resources on the Internet, may have considerable implications for teaching, learning, and research. Teachers and students depend more and more on the

Internet for their various educational purposes. The present survey is, therefore, an attempt to assess the effectiveness of the Internet as an educational tool, and what role it plays in the educational system with particular reference to the Agricultural College in the state of Manipur. The Internet is an integral part of today's Agricultural educational system. Agricultural colleges invest a good deal of amount on providing this facility to both the teachers and students. It is, therefore, essential to find out up to what extent they are utilizing this facility. With the spectacular scope of the Internet, the students and faculties of the College of Agriculture, Central Agricultural University(CAU) have been providing internet facility from 2002 onwards to perform the triple function of teaching, research and extension education in an effective manner. This facility for connecting students and faculties with each corner of the world reduces the time lag to a considerable extent. It helps academicians, research workers, and students to get quick solution of their questions and queries. This facility makes it possible to keep alive contact among the scientists, academicians, research scholars, and students of the University globally. In view of above facts and notions, the present study was carried out with the specific objectives viz. to Access Internet Utilization among Undergraduate Students in College of Agriculture, Central Agricultural University

Decolorization of Saree dyes, by *Aspergillus niger* MTCC1344 and their effect on Tomato (Gaytri F1 hybrids)

Karuna Singh & Pankaj Kumar

Abstract

Removal of noxious dyes from textile effluent has been a matter of concern, both in the artistic sense and health point of view. Color removal from textile effluents on an industrial level has been given much consideration in the last few years, not only because of its potential toxicity, but also mainly due to its visibility problem. There have been various promising techniques for the removal of dyes from textile effluent, but the effectiveness of biosorption for dye removal from wastewater has made it an ideal alternative to other treatment methods. The objective of this paper is to study the potential for removal of textile water, by fungi *Aspergillus niger* MTC1344 and its effect on tomato, at different concentration were also studied. *Aspergillus niger* was shown to be an efficient fungus for removal of saree dye effluent and it can decolorize dye effluent up to 78.14% at 7th days of incubation period. The germination %, seedling growth, and shoot length showed a gradual decline with increase in effluent concentration.

Index Terms: Textile water. Removal. *Aspergillus niger* MTC1344. Decolorization. Germination.

1 Introduction

From first synthetic dyes Mauveine which was discovered by Perkin in 1856 to till now a large amount of dyes were used. Dyes use in industries like textile, cosmetic, leather, pulps mills, printing, dye synthesis, foods and plastic industry. It is estimated that these industries produce a large amount of waste water containing dyes. Approximately 10-15% of dyes are washed into environment after their use in dyeing unit [1]. In India, an average mill producing 60×10^4 m tonne/day (CPCB 2009). About 50% of dyes uses in industries are belong to the group of azo compounds, such as Methyl orange, Congo red (C R), and Direct black 38(DB38) which contain chromophore (-N=N-) in their molecular structure [2]. The removal of dyes is great concern because they are toxic,

mutagenic, carcinogenic and teratogenic, specially Benidine present in dye which may initiate cancer in the organism [3, 4 & 5]. Dyes are easily visible and very difficult to biodegraded, even in very low concentration it can causes allergy, dermatitis and skin irritation, depending on the exposure time and dye concentration. Dyes also accumulate in food chain and resist to microbial degradation [6 & 4]. Some of the impact of dyes on environment was summarized in Fig. n.1.

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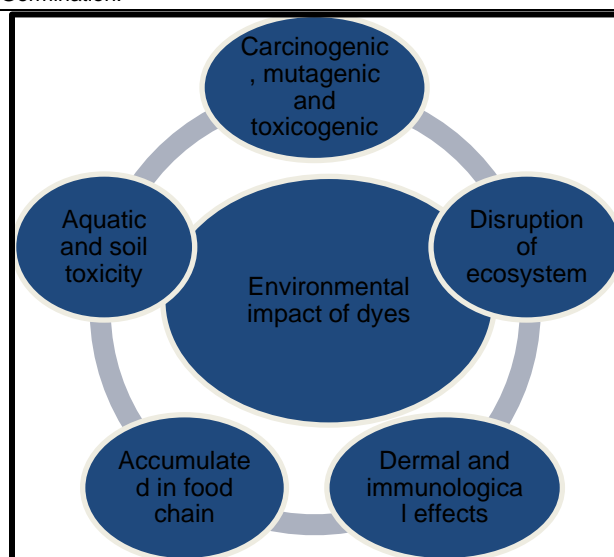


Fig.1 Environmental impact of dyes

Therefore, the degradation and decolorization of these dyes have become a necessity. Physicochemical methods like absorption [8], photocatalysis, [7 & 8], coagulation-fluculation [9 & 10], Reverse osmosis [11] have been used but their effectiveness is low due to high cost, energy intensive, have limited use and can lead to the production of toxic by-products and a large amount of sludge [12]. The biological degradation of dyes is more attractive as an ecological, economical and high effectiveness [13 & 14]. The main mechanism of dye removal is biodegradation followed by biosorption. Fungi like *Aspergillus flavus* [15], *Aserpegillus lentulus* [16], *Aspergillus niger* [17]. Therefore, present work has been carried out the removal of textile water by the use of *Aspergillus niger* MTCC1344 in different growth condition. The effect of pH, chemical oxygen and absorption were studied during process. Impact of textile water at different concentration and duration of growth on tomato were also studied. The effect of germination %, seedling growth, and shoot length were studied.

2 Material and methods

Textile dye effluent

NATURAL DYES: AN EMERGING ECOFRIENDLY SOLUTION FOR TEXTILE INDUSTRIES

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ABSTRACT

Natural dyes are derived from natural sources like plants, animals, minerals and microorganism. Natural dyes are sustainable as they are renewable and biodegradable and also fulfill the huge demand of textile industry. In India, an average mill producing 60×10^4 m/day of fabrics likely to discharge, approximately 1.5 million L/day of effluent. Excessive use of these synthetic dyes in textile industry may lead to serious health hazards and disturbances in eco-balance of nature. The associated toxicity, carcinogenicity and allergic reactions of the synthetic dyes have raised an interest in natural dyes which are clinically safer, disease free, non-polluting and biodegradable. Present review highlights sources of dyes, classification of dyes, and properties of some common natural dyes.

KEY WORDS: Natural dyes, Sustainable, Renewable, Biodegradable, Hazards.

INTRODUCTION

The textile, leather, paint, and cosmetics industries produce large quantities of wastewater containing dyes that are becoming a major environmental threat. In all these industry, textile industry produces a large amount of dye containing waste water. These effluents containing heavy load of harmful chemicals has contributed to the severe pollution of water, soil and the major polluters of our environment (Gyanendra *et al.*, 2015). Estimated consumption of the textiles globally is around 30 million tonnes for which the expected increase is at the rate of about 3% per annum (Rajendran and Thamarai, 2014). About 70,0000 tones of different dyes are required for the coloration of such a bulk quantity of the textiles (Ogugbue and Sawidis, 2011). Discharge of dye containing wastewater into natural streams and rivers poses serious threat to the aquatic biota, disruption of photosynthesis, food web and in turn causes damage to the aesthetic nature of the water and environment as well. Some of the dyes can cause allergic dermatitis, skin irritation and many types of cancers. There are so

many techniques available for removal of dyes like physical, chemical and biological but these methods are costly, energy demanding, generating secondary product and huge amount of sludge. So in this situation natural dyes are among the promising options for developing a greener textile dyeing process.

Natural dyes derived from natural things like plant leaves, wood, bark, stem, seed, root, insect secretion and minerals. Natural dyes exhibit long endurance, beauty and charm. The international rising demand of the natural dyes is about 10,000 tonnes which is merely 1% of the world synthetic dye consumption (Sachan and Kapoor, 2007). Natural dyes are eco-friendly, renewable and also biodegradable, upon degradation; natural dyes do not produce any toxic secondary product. Natural dyes can be used for dyeing of all natural fiber, food additives, medicines, handicraft items and toys, and in leather processing. Many of the dye-yielding plants are used as medicines in various traditional medicinal systems. Textiles produced in Kerala, India by dyeing with herbs as per the traditional Ayurvedic system of medicine and known also as

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Harvesting period and Yield performance of Oyster Mushroom (*Pleurotus ostreatus*) on different agro-substrate

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ABSTRACT

Mushroom is an excellent food source to alleviate malnutrition in developing countries due to its flavor, texture and nutrition. It is very popular and widely cultivated through the world mostly in Asia and Europe. The four simple substrates namely wheat straw, paddy straw, maize stalk and saccharum straw were tested for growing *P. ostreatus* by poly bag method. The present investigation have indicated that wheat straw is also a good substrate and give high yield performance for the cultivation of *pleurotus ostreatus*

Key Words : *Pleurotus ostreatus*, substrate wheat, paddy maize, straw yield ,Basidio corp.

INTRODUCTION

Pleurotus species is simply a macro fungus and its cultivation in rural area helps to solve the problem of agro-waste management in a profitable way along with the upliftment of socioeconomic status of the farmers by producing a highly nutritious food item. *P.ostreatus* is the most common oyster mushroom species, on dry weight basis contains protein 47.93%, reducing sugar 0.28%, ascorbic Acid 0.06% ,ash 8.25% ,non reducing sugar is lacking, starch 9.12% and fat 2.26% .Bahl, 1994 and Dhoke 2001.



A review of Post Harvest Management and value addition of horticultural crops: A source of income generation for the farmers of Easter Utter Pradesh

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Abstract

India harvested 223.089 million tonnes of horticultural produce from 20.876 million hectares of land in the 11th five year plan. The major crops contributing to it are fruits and vegetables (approx 204 million tonnes from 14.314 million hectares area). Horticulture sector contributing 30 percent to the India's agricultural GDP from 8.5 percent of cropped area. As the waste utilization technology are adopting in developed countries and the scales of economies of these technologies does follow in Indian conditions due to various factors. Therefore, there is a need for development of cost effective technologies for the production of value added products. Post harvest management of fruits and vegetables provides ample opportunities for value addition besides providing wealth from waste. Its effective utilization helps in reducing the cost of production of crops besides optimum utilization of biomass. A several process technologies used to utilize fruit and vegetables such as drying & dehydration, freezing, fermentation, extraction, etc., are some treatment examples that can be useful to recycling and upgrading waste of fruit and vegetable market.

Keywords: Horticulture, Post Harvest management, Post Harvest losses, Value Addition, Biomass, etc.

Introduction

The horticultural crops has the huge potential for development of wastelands through planned strategies, need comparatively less water than food crops, provide higher employment opportunity and environment-friendly. On the basis of nutritional security, fruits and vegetables have high potential of value addition that gives high foreign exchange earnings and is an important item of commerce as they have gained enormous market potential. Horticultural crops in Indian agricultural economy shared a significant role as it contributes 30% to the GDP from 11.73 % of its arable land area. Indian fruits and vegetable sector is the largest in the world next to China in terms of production with estimated food processing industry size of US\$ 70 billion as in 2012, India had the production of 257 million tons of food grain (rice, wheat, coarse grains and pulses), 75 million tons of fruits and 149 million tones of vegetables. India has very high post harvest losses of fruits and vegetables which reached to 30 to 40 per cent and only 2.2 % of the total production are under processing as compared to the other countries like USA and China which are far ahead than India in reducing the wastage and enhancing the value addition and shelf life of the farm products. Different organizations in India have been trying to find solution for serious issue related to post-

ACUTE TOXICITY OF LEAD ACETATE AND ITS EFFECTS ON THE BEHAVIOUR OF A FRESHWATER CATFISH, *HETEROPNEUSTES FOSSILIS* (BLOCH)

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ABSTRACT : Lead is a non essential highly toxic metal widely distributed in environment. A bioassay experiment was carried out to determine the acute toxicity of lead acetate on freshwater catfish, *Heteropneustes fossilis* for different time intervals viz; 24h, 48h, 72h and 96h. The 96h LC50 value of lead acetate was found to be 360.50mgL⁻¹ and its presumably harmless (safe) concentration was 20.95mgL⁻¹. The behavioural responses of fish on exposure to lead acetate included erratic movement, hyperexcitability and restlessness. In the present study, fish exhibited frequently jumping, secretion of excess mucous from the gills and the body. The fish appeared excited with a rapid rate of operculum movement accompanied by occasional gulping of air and ultimately loss of equilibrium on exposure to different concentration of the chemical.

Key words : Lead acetate, acute toxicity, behaviour, *Heteropneustes fossilis*.

INTRODUCTION

Environmental pollutants such as metals, pesticides and other organic chemicals pose serious risks to many aquatic organisms. Accordingly a great deal of previous research has characterized physiological mechanisms of toxicity in animals exposed to contaminants. Lead is a non essential highly toxic metal widely distributed in environment. It escapes into the environment during smelting of its sulphide ore galena as well as from storage batteries, pipes, etc. A certain amount of contamination of food and domestic water results from the use of lead ceramics, china glass and porcelain enamels in food processing equipments and kitchenware. Some foods, dyes and cosmetics contain lead compounds as artificial colouring agents. It is also discharged with water from lead mines, lead refining storage battery as well as plants for manufacture of tetra ethyl lead.

The biological effects of lead upon aquatic as well as terrestrial organisms vary according to species, duration of exposure, concentration of lead and experimental factors such as hardness of water and pH. The organic form tends to produce more toxic effects at lower concentration than inorganic form. In contrast, effects of lead on fish behavior are less studied. The industrial effluents have altered the natural conditions of aquatic

medium which causes behavioural changes and morphological imbalance of aquatic organisms (Yadav *et al*, 2005). The behavioural changes in fish has been found to be a sensitive tool for assessment of metal toxicity. Heavy metals in limited quantity are very essential for biological processes but their excess not only affects the life sustaining processes but also causes imbalances in the bio-diversity (Bordoloi *et al*, 2002; Indra *et al*, 2006).

The aim of the present study was to estimate acute toxicity values of lead acetate and its effects on behavioural changes of a freshwater catfish, *Heteropneustes fossilis* at different dose and time intervals.

MATERIALS AND METHODS

Live specimens of adult *Heteropneustes fossilis* (Weight 34.50± 3.20g, length 13.25± 1.5cm) were collected from local fish market and acclimated to laboratory conditions for ten days. They were fed daily adlibitum with a mixture of oil cake and rice bran (1:1).

Physico-chemical characteristics of test water used were pH 7.4±0.5, temperature 24°C±2, hardness 144.40±3.80 mg/l as CaCO₃, chloride 7.2±0.8 mM/l, DO 8.20±0.90 mg/l, BOD 20.0±2.6 mg/l and COD 110±5.8

Solution of Multi-Dimensional Fredholm Equations Using Legendre Scaling Functions

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Abstract

In this article, we construct approximate solution to multi-dimensional Fredholm integral equations of second kind using n -dimensional Legendre scaling functions. Error analysis of the problem is provided in the L^2 sense. It is shown that our numerical method is numerically stable. Some examples are discussed based on proposed method to show the importance and accuracy of the proposed numerical method.

Keywords: Legendre scaling functions, multi-dimensional Fredholm integral equations, Error analysis, Numerical stability.

1. Introduction

Integral equations have been found to form a very important area of research in mathematics having direct applications in many physical problems [1] and indirectly being applied in reformulating many mathematical models [2-3]. Integral equations have applications in the fields of economics, optimal control problems, biology, electrical theory, game theory, etc. [4-5] also. There are many physical models which can be described by two dimensional and three dimensional integral equations [6-7]. Thus, it should be fruitful to study higher dimensional integral equations for application in physical problems of different natures. In this paper, we consider multi-dimensional Fredholm integral equation (MDFIE) of the second kind and which is given by

$$u(x_1, \dots, x_n) = g(x_1, \dots, x_n) + \underbrace{\int_0^1 \int_0^1 \dots \int_0^1}_{n\text{-times}} k(x_1, \dots, x_n, y_1, \dots, y_n) u(y_1, \dots, y_n) dy_1 \dots dy_n, \quad (1)$$

$$(x_1, \dots, x_n) \in D = \underbrace{([0, 1] \times [0, 1] \times \dots \times [0, 1])}_{n\text{-times}}$$

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MARKETING OF MAJOR VEGETABLES IN VARANASI DISTRICT OF UTTAR PRADESH

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Abstract

India is second largest producer of fruits and vegetables in world. India produces about 14% of world's vegetables from 15% world's area. The vegetable productivity in India is less than the world average productivity. Nearly 30-40% vegetables were wastage during the supply chain i.e. reaching from producer to consumer. Most of the marketing of vegetables in India is done in unorganized sector and very little quantity is marketed through organized sector. Present study was an attempt to study the marketing channels and to examine the marketing efficiency of organized retail chain. The Varanasi district of Uttar Pradesh was selected purposively for the present study. Spencer retail Bhelupur was selected purposively. A total of 45 farmers, 4 intermediaries, one retailer and 60 consumers were selected. Vegetables viz tomato, cabbage, pea, okra and brinjal were selected for the study. Among the organized supply chain i.e. channel II, the cost incurred per kg of vegetables was much lower than the cost incurred in the traditional supply chain i.e. channel I. In channel - I, the net return and marketing efficiency was higher for channel II than channel I for all the vegetables under study. At the same time organized supply chain was found to be smallest price spread. Hence organized supply chain (channel - I) was found more efficient as compared to unorganized supply chain (Channel - II). Hence it is advisable to the farmers to sell their produce through modern supply chain i.e. channel II as it is more efficient because the commodity was purchased directly from the producer.

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ORIGINAL ARTICLE

Economics of Marketing of Marigold Flowers in Baghpat District of Uttar Pradesh

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ABSTRACT

The Floriculture has assumed a definite commercial status. Its potential as a viable agribusiness has also been recognized. The present study was carried out in Baghpat district of Uttar Pradesh, with the objective to find out the study examined various economic aspects of marigold such as assessment of price spread, producer's share in the consumer's rupee, marketing cost and margins, marketing practices, channels involved in the marketing of marigold and problems faced by the growers in marketing of marigold. Following Three marketing channels were identified in the study area for marketing of marigold – Channel I: Producer - Commission agent – Wholesaler - Retailer - Consumer. Channel II: Producer - Wholesaler - Retailer - Consumer. Channel III: Producer - Consumer. Among these channels, 33.29 per cent quantity of marigold moved through channel- I, 41.77 per cent through channel- II and 24.93 per cent through channel- III. Marketing cost in the sale of marigold was Rs.684.03, Rs.400.13 and Rs.40.42 per quintal in channel-I, channel- II and channel- III, respectively. As such marketing cost was lower in channel- III and higher in channel- I. Marketing margins earned by the different agencies were highest in the channel- I (Rs.390.19 per quintal) and it was lowest in channel- II (Rs.277.53 per quintal). The producer's net share was maximum in channel- III (100 per cent) and minimum in channel- I (85.74 per cent) which was favourable to the producer. Out of all farmers, 90.00 percent reported the problem of higher commission charges followed by delay in payment, high cost of transportation, lack of scientific knowledge and training, Lack of scientific storage facilities, and Lack of availability market news and information of market prices in the study area.

Keywords : *Marigold, Disposal, Price spread, Marketing cost and Marketing Margins.*

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INTRODUCTION

India is a long tradition of floriculture. Flowers have been depicted in ancient paintings. However, the social and economic aspects of flowers growing were recognized only later. It is only in the last three decades with changing life styles and under increased urban affluence. Marigold flower cultivation is getting increasingly popular among farmers. Marigold, belonging to family Asleraceae, is an important and popular flower of India and ranks third in number after roses and chrysanthemum. The commercial cultivation of seedling plot of marigold is a source of income and employment to marginal farmers as well as large farmers. It is an important ornamental herb grown for its highly decorative and long lasting flowers. Marigold is a very important flowering plant useful for garlands, garden disc play, loose flowers and perfume industries; Marigold is one such potential flower crops for natural colour extraction. Marigold is not only grown as ornamental cut flowers and landscape plant but also as a source of ceremonies like wedding, birthday, and marriage day greetings, religious offerings and sometimes in social, political, and historical occasions. The universal usage has created a real trend of producing flower on a commercial basis to fulfill increasing demand within the market. Flowers grown in Rajasthan are exported to Japan, Holland, Singapore, U.A.E. Germany and Switzerland. In U.P. Meerut, Baghpat, Saharanpur, Varanasi, Allahabad, Sultanpur and Ghazipur districts are flowers cultivation districts in

Original Research Article

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An Economic Analysis of Production of Sugarcane under various Methods of Irrigation in Sonipat District of Haryana, India

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ABSTRACT

The present study on economic analysis of sugarcane cultivation was fulfilled with the specific objective to estimate cost and return in sugarcane cultivation was conducted in Sonipat district of Haryana state during the year 2017-18. It was selected 4 blocks randomly; namely Sonipat, Kharkhoda, Gohana, and Ganaur blocks from sonipat district were undertaken on the basis of maximum area brought under cultivation of sugarcane of haryana state. 200 farmers were selected randomly from four blocks out of which, marginal (14), small (49), medium (69) and large (68). The findings of the study envisaged that among the different irrigation methods, drip method was the highest percentage at large farm in sugarcane cultivation and found to be 78.70 percent area, which was start decreasing as farm size decreases. Drip method was not popular among marginal and small farmers. The sampled households were sugarcane growers and percentage area under sugarcane was ranging from 26.08 percent at large farms to 31.25 percent at marginal farms. The cropping intensity was also high, which varied from 105 percent at large farms to 267 percent at marginal farms. The inputs/material use in fresh sown sugarcane and ratoon crop was not as per the recommendation and initial inputs use, labour and power use were found to be less than fresh sown sugarcane. The cost of cultivation of crop under flood ratoon was 93728 Rs/ha, sprinkler 97973 Rs/ha and drip 93568 Rs/ha whereas, it was found to be flood fresh sown sugarcane was 126188 Rs/ha, in sprinkler 133957 Rs/ha and in drip 136043 Rs/ha, respectively. This gives us variable cost incurred in ratoon crop was less than fresh sown sugarcane. The benefit cost ratio in ratoon crop of sugarcane was comparatively higher in all three methods of irrigation than that of fresh sown sugarcane; it indicates that ratoon crop has involvement of low cost of production and high net return but not have long term benefit to increase the productivity of sugarcane.

Keywords

Sugarcane, Productivity, Cost of cultivation, Net return, Benefit cost ratio

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Introduction

Sugarcane is an important commercial crop of the world and the cultivation of sugarcane, in India dates back to Pre-Vedic period (2000

B.C.). India is one of the principal centers of the origin of the sugarcane. Sugarcane is grown in diversified climatic condition i.e. tropical and sub-tropical. Sugarcane cultivation and development of sugar industry

Effect of Zn and S Interaction on Soil Properties and Yield of Rice (*Oryza sativa L*)

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Abstract- A field experiment was conducted during *Kharif* season of 2018 on research plot of Udai Pratap (Autonomous) College, Varanasi (U.P.) adjoining the Department of Agricultural Chemistry and Soil Science. The physicochemical properties of the experimental soil were ; pH (7.65), EC (0.26 dS m⁻¹); organic carbon (0.58%), available nitrogen (258.5 kg ha⁻¹), available phosphorus (12.6 kg ha⁻¹), available potassium (165 kg ha⁻¹), available sulphur (9.4 kg ha⁻¹) and available (DTPA extract) zinc (2.17 ppm). The experiment was carried out in randomized block design (RBD) with three replications and following six treatments: T₀ = Control (RDF) T₁= RDF + Zinc @ 20 kg ha⁻¹, T₂= RDF + Sulphur @ 40 kg ha⁻¹, T₃= RDF + Zinc @ 20 kg ha⁻¹ + Sulphur @ 60 kg ha⁻¹, T₄= RDF + Zinc @ 25 kg ha⁻¹ + Sulphur @ 40 kg ha⁻¹, T₅= RDF + Zinc @ 30 kg ha⁻¹ + Sulphur @ 30 kg ha⁻¹. Application of Zn and S significantly affected the growth parameters (plant height and tillers) of rice. Plant height and number of tillers significantly increased over without Zn and S. Maximum was registered with T₄ (Zn @ 25 kg ha⁻¹ + S @ 40 kg ha⁻¹). Grain and straw yields were also significantly increased by the different treatments and highest yields were registered with T₄. The minimum concentration of Zn and S were registered with treatment T₀ and the maximum in T₄ (Zn @ 25 kg ha⁻¹ + S @ 40 kg ha⁻¹). The application of Zn and S increased the availability of the nutrients (N, P, K, S and Zn) in the post harvest soil. It can be concluded from the present study that adequate Zn and S availability during entire cultivation period is important for good rice growth and yields.

Index Terms- S, Zn, Rice, Interaction

I. INTRODUCTION

Sulphur is an essential secondary plant nutrient play key roles in chlorophyll synthesis and oil formation. Sulphur is an important constituent of methionine, cysteine and cystine, amino acids and glutathion, biotine, thiamine linoleic acid, acetyl co-A structural constituent. Sulphur improves both yield and quality of crops. Deficiency of sulphur is increasing due to continuous use of S- free fertilizers and increasing cropping intensity with high yielding cultivars and is more conspicuous in coarse textured soils low in organic matter (Sipai *et al.*, 2016).

Micronutrients are essential for increasing crop production and enhancing animal and human health. Zinc is one of essential plant micronutrients and its importance for crop productivity is

similar to that of major nutrients. Intensive agriculture coupled with the continuous use of N, P₂O₅, and K₂O fertilizers have remarkably increased the production but simultaneously brought about problems related to micronutrient deficiencies, particularly that of Zn in soil. About one third of agricultural soils in the world are estimated to be low in available zinc (Zn), resulting in poor crop yields and nutritional quality of the harvested grains (Alloway 2008; Cakmak 2008).

Rice (*Oryza sativa L.*) is the most common and important food crop of India in terms of both area, production and consumer preference. Rice production in India crossed the mark of 112 million tonnes achieved in 2017-18 accounting for 21.19% of global production in the year. The productivity of rice has 3742 kg per hectare in 2017-18. India has largest area (43.20 million hectare) followed by China (30.35 m ha), Indonesia (12.16), Bangladesh (12.0 m ha) and Vietnam (7.66 m ha). In respect of production India rank second (FAO STAT 2017). The responses to the application of sulphur and zinc in rice crop have been supported by many findings. There is need to ascertain and promote the uses of fertilizers required to correct the deficiency of S and Zn. Keeping in the view of the importance of rice in the Indo Gangatic plain and role of sulphur and zinc nutrient in crop physiology and ultimately in the yield, this experiment was undertaken.

II. MATERIALS AND METHODS

A field experiment was conducted during *Kharif* season of 2018 on research plot of Udai Pratap (Autonomous) College, Varanasi (U.P.). The soils of Varanasi formed on alluvial, deposited by river Ganga have predominance of illite, quartz and feldspars. Illite minerals are partly inherited from micas which are predominant in the sand and silt fractions. The physicochemical properties of the experimental soil were ; pH (7.65), EC (0.26 dS m⁻¹); organic carbon (0.58%), available nitrogen (258.5 kg ha⁻¹), available phosphorus (12.6 kg ha⁻¹), available potassium (165 kg ha⁻¹), available sulphur (9.4 kg ha⁻¹) and available (DTPA extract) zinc (2.17 ppm). The experiment was carried out in randomized block design (RBD) with three replications and following six treatments: T₀ = Control (RDF) T₁= RDF + Zinc @ 20 kg ha⁻¹, T₂= RDF + Sulphur @ 40 kg ha⁻¹, T₃= RDF + Zinc @ 20 kg ha⁻¹ + Sulphur @ 60 kg ha⁻¹, T₄= RDF + Zinc @ 25 kg ha⁻¹ + Sulphur @ 40 kg ha⁻¹, T₅= RDF + Zinc @ 30 kg ha⁻¹ + Sulphur @ 30 kg ha⁻¹. Recommended doses of



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Effect of Ni and N sources on wheat (*Triticum aestivum* L.) yield and nutrient uptake

MK Singh, RP Singh, PK Yadav, SKS Chandel and SN Singh

Abstract

Nitrogen is the most extensively limiting plant nutrient in crop production. A majority of soils in the world are mineral soils and nitrogen deficiency in mineral soils is widespread. Nickel is an essential micronutrient for normal plant growth and development and part of several biological functions. Ni being a vital element contribute significant role in nitrogen assimilation as well as helps plants against numerous biotic and abiotic stresses. Keeping these facts in view a field experiment was conducted in Rabi Season of 2018-19 at the research plot of Department of Agricultural Chemistry and Soil Science, Udai Pratap (Autonomous) College, Varanasi. The experiment was carried out in Factorial Randomized Block Design (FRBD) with three replications. Treatment includes two nitrogen levels (0 and 120 kg ha⁻¹) with three nitrogen sources viz; N₁₂₀UR (Urea), N₁₂₀AS (ammonium sulphate), N₁₂₀CAN (calcium ammonium nitrate) and four nickel levels 0, 1, 2 and 4 kg ha⁻¹ (Ni₀, Ni₁, Ni₂ and Ni₄). Ni was applied in the form of NiCl₂.H₂O as per the requirement of treatment as basal dose. Important growth parameters (plant height and number of tillers) at different growth stages, dry matter yield (grain and straw) and nutrient uptake were determined. Results revealed that nitrogen and nickel supply significantly affected all the parameters under study when compared with no supply of nitrogen and nickel. The nitrogen application through urea registered the highest growth parameters, dry matter yield as well as nutrient content and their uptake by grain and straw of wheat as compared to ammonium sulphate and calcium ammonium nitrate. The nickel application @ 2 kg ha⁻¹ recorded significantly maximum increase in all growth attributes as well as yield attributes. The interaction effect was found to be significant. Due to interaction effect maximum plant height, number of tillers and dry matter yield were recorded with the treatment N₁₂₀URNi₂, followed by N₁₂₀AS Ni₂ and N₁₂₀CANNi₂. Whereas, maximum nitrogen and nickel contents and their respective uptake were recorded with N₁₂₀URNi₄.

Keywords: Nickel, nitrogen, wheat yield, N & Ni uptake

1. Introduction

Present agricultural system depends upon mining of plant nutrients by adoption of intensive tillage, use of high yielding varieties, imbalanced use of organic and inorganic sources of plant nutrients, less recycling of crop residues into the soil, soil erosion and injudicious use of irrigation water (Singh *et al.* 2019) [23]. Fertilizer is an essential input to agriculture used by the farmers and directly affected by the crop response, fertilizer cost, price realized by farmers for their produce and the access to the fertilizer. India is the second largest producer and consumer of nitrogenous fertilizer in the world (Praveen a 2014) [18]. A majority of soils in the world are mineral soils and organic soils occupy only a small area. Nitrogen deficiency in mineral soils and crops is widespread, and nitrogen is the most extensively limiting plant nutrient in crop production. Essentiality of nickel (Ni) for higher plants was first reported by (Dixon *et al.* 1975) [5]. Nickel is an essential micronutrient for normal plant growth and development and part of several biological functions (Brown 2007) [2]. It is an integral part of several enzymes such as glyoxalase-1 and urease required for nitrogen metabolism in higher plants (Mustafiz *et al.* 2014) [14]. Wheat is staple food crop of India. It is used in different purposes namely source of carbohydrate, protein and raw materials for different food manufacturing industries. 90% Indian soils are deficient in nitrogen, wheat crop requires high rate of nitrogenous fertilizers. Among the nitrogenous fertilizer sources, the farmers utilize urea as nitrogen source than other sources like, ammonium sulphate, calcium ammonium nitrate etc. due to its high tolerance of plants to the ionic form of nitrogen. Keeping these facts in view, present experiment was carried out to observe the significance of nitrogen source and nickel supply for wheat crop.



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Effect of nickel with different sources of nitrogen on rice (*Oryza sativa* L.)

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Abstract

A field experiment consisting of 6 treatment combinations of two levels of Ni (@ 1 and 2 kg ha⁻¹) with two nitrogen sources and three replications was conducted under randomized block design at research plot of Udai Pratap (Autonomous) College, Varanasi (U.P.). The main objective of study was to find out the effect of Ni with different sources of nitrogen on growth and yield of rice (*Oryza sativa* L.). The experiment was laid out in a randomized block design (RBD) having 6 treatments and 3 replications. Treatments were T₀= control, T₁= nitrogen through ammonium sulphate + Ni @ 1 kg ha⁻¹, T₂= nitrogen through ammonium sulphate + Ni @ 2 kg ha⁻¹, T₃= nitrogen through urea + Ni @ 1 kg ha⁻¹, T₄= nitrogen through urea + Ni @ 2 kg ha⁻¹ and T₅= 50% nitrogen through Urea and 50% nitrogen through ammonium sulphate + Ni @ 2 kg ha⁻¹. The results revealed that the growth, yield, organic carbon and available N, P and K status of soil was significantly increased by application of Ni @ 1 and 2 kg ha⁻¹ with different nitrogen sources (urea and ammonium sulphate) as compared to control. Similar results were also observed with nutrients (N, P and K) content and uptake by the rice.

Keywords: Nickel, nitrogen, urea, ammonium sulphate, rice

1. Introduction

Ni is the most recent candidate to be added in the list of essential nutrient for higher plant. Ni is considered as an essential element primarily because of its function as an irreplaceable component of urease which is responsible for the hydrolysis of urea N. Urea N acquired by plant is not available for plant N metabolism unless hydrolyzed to CO₂ and NH₃. Consequently, urea grown plants are highly sensitive to inadequate Ni supply (Gerendas and Sattelmacher, 1999a) [9]. Additionally, seed treatment together with Ni fertilization of soybean might improve the efficiency of biological nitrogen fixation (BNF), boosting grain dry matter yield and N content (Lavres *et al.*, 2016) [13]. Among the nitrogenous fertilizer sources, urea is most popular than other nitrogenous fertilizer like, ammonium sulphate, ammonium nitrate etc. However, urea N requires conversion of nitrogen into inorganic form it is hydrolyzed by urease enzyme before its utilization by plant roots. (Gerendas *et al.*, 1998) [8] found that in plants supplied with urea and Ni, the growth was impaired at the lower levels of Ni, whereas, in plants supplied with NH₄NO₃ and Ni, growth was not affected by micronutrient.

2. Materials and Methods

The field experiment was conducted in the *kharif* season of 2016 at research plot of UdaiPratap (Autonomous) College, Varanasi (U.P.). The soil (0-15 cm) of the experimental plot was of alluvial origin, sandy loam in texture, having electrical conductivity (EC) of 0.51 dS m⁻¹, pH 7.62 with 0.61% organic carbon (OC). The soil was low in available N (131.2 kg ha⁻¹), available P (14.2 kg ha⁻¹), and available K (182.3 kg ha⁻¹). The experiment was laid out in a randomized block design (RBD) having 6 treatments and 3 replications. Treatments were T₀= control, T₁= nitrogen through ammonium sulphate + Ni @ 1 kg ha⁻¹, T₂= nitrogen through ammonium sulphate + Ni @ 2 kg ha⁻¹, T₃= nitrogen through urea + Ni @ 1 kg ha⁻¹, T₄= nitrogen through urea + Ni @ 2 kg ha⁻¹ and T₅= 50% nitrogen through Urea and 50% nitrogen through ammonium sulphate + Ni @ 2 kg ha⁻¹. The crop was fertilized with recommended dose of 120 kg N, 60 kg of P₂O₅ and 60 kg of K₂O ha⁻¹. Half dose of N and full doses of P₂O₅ and K₂O were applied as basal application. The remaining N was applied at tillering and panicle initiation stages. Ni was applied in the form of NiSO₄ as basal application. The crop was irrigated as per recommended schedule and harvested at maturity. Growth and yield attributes were recorded.



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Agronomic fortification in wheat (*Triticum aestivum* L.) with zinc

Manish Kumar, RP Singh, PK Yadav, Vibha Singh, SK Patel, SKS Chandel and SN Singh

Abstract

Zinc is one of the essential plant micronutrient and its importance for crop productivity is similar to that of major nutrients. Intensive agriculture coupled with the continuous use of N, P, K fertilizers have remarkably increased the production but simultaneously brought about problems related to micronutrient deficiencies, particularly that of Zn in soil. Zinc deficiency is major risk factor to crop production and human health. A field experiment was conducted during Rabi Season of 2018-19 at Research Plot of Department of Agricultural Chemistry and Soil Science, Udai Pratap (Autonomous) College, Varanasi. The experiment was laid out in a randomized block design with six treatment combinations and three replications. Treatment includes T₀ = Control (RDF), T₁ = RDF + ZnSO₄ @ 25 kg ha⁻¹, T₂ = RDF + ZnSO₄ @ 50 kg ha⁻¹, T₃ = RDF + T₁ + 3 FS @ 0.5% ZnSO₄ at PF, HS and MS, T₄ = T₂ + 2 FS @ 0.5% ZnSO₄ at PF and MS, T₅ = RDF + ZnSO₄ @ 5kg ha⁻¹ + F S @ 0.5% at HS. FS = Foliar Spray, PF = Pre Flowering Stage, HS = Heading Stage, MS = Milking stage, RDF = Recommended Dose of Fertilizer. Important growth parameter (plant height and number of tillers) at different growth stages and dry matter yield (grain and straw) was determined. Application of Zn significantly affected the plant height, number of tillers, grain and straw yields over control (without Zn). Maximum was registered in the treatment T₄ (ZnSO₄ @ 50 kg ha⁻¹ and 2 FS @ 0.5% ZnSO₄ at PF and MS). All the treatments have significant positive effect over control in case of nutrient content in plant. The minimum nutrient content and its uptake were recorded with T₀ and the maximum under the treatment T₄. Application of Zn also increased the availability of nitrogen, phosphorus and potassium in post harvest soil.

Keywords: Wheat yield, NPK & Zn content and uptake, Available NPK

1. Introduction

The state of Uttar Pradesh in North India is covers an area of 24.09 m ha and has 16.81 m ha of cultivated area, constituting 70 per cent of the total geographical area. The irrigated area is 73 % and cropping intensity is 153 %. Present agricultural system depend upon mining of plant nutrients by adoption of intensive tillage, use of high yielding varieties imbalanced use of organic and inorganic sources of nutrients, less recycling of crop residues into the soil, soil erosion and un judicious use of irrigation water. Zinc is one of the essential plant micronutrient and its importance for crop productivity is similar to that of major nutrients. Intensive agriculture coupled with the continuous use of N, P, K fertilizers has remarkably increased the production but simultaneously brought about problems related to micronutrient deficiencies, particularly that of Zn in soil. In India, analysis of over 2,50,000 soil sample from 20 states show that 48 % soils are Zn deficient with DTPA- Zn values below 0.6 mg kg⁻¹ (Singh, 2009) [14]. Shukla *et al.* (2014) [13] reported that about 43% soils in India are potentially Zn deficient. Zinc application to Zn deficient soil has been found to boost the growth of plants and yield of crops to a great extent. Bio-fortification is a recent approach aimed at increasing the bio-available nutrients, such as Fe and zinc, in the staple crops rather than using fortificants or supplements (Waters and Sankaran, 2011) [21] (White and Broadley, 2009) [22]. Being the major staple, wheat contributes more than two-thirds of Fe and almost one-third of calcium required by adult in low socio-economic groups of the population in northern India. Therefore, the composition and nutritional quality of wheat grain has significant impact on human health and well-being, especially in the developing world. Hence the present study initiated to investigate the agronomic fortification in wheat (*Triticum aestivum* L.) with zinc.

2. Materials and Methods

Field experiment was conducted in Rabi Season of 2018-19 at the research plot of Department of Agricultural Chemistry and Soil Science, Udai Pratap (Autonomous) College, Varanasi. The experiment was carried out in Randomized Block Design (RBD) with six treatments and three replications. Treatments includes T₀ = Control (RDF), T₁ = RDF + ZnSO₄ @ 25 kg ha⁻¹,

Original Research Article

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Effect of Different Basal Doses of Boron on Growth and Yield of Urdbean (*Vigna mungo* L.)

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ABSTRACT

A field experiment was conducted to study the effect of different basal doses of boron on growth & urdbean during *Zaid* season 2015 at farm of department Soil Science & Agricultural Chemistry, Udai Pratap Autonomous College Varanasi. The experiment consisted of six treatments replicated thrice in RBD. The treatment include of T₀ = Control (No input), T₁ = RDF (NPK @20:20:30 kg ha⁻¹), T₂ = (RDF + B @ 0.5 kg ha⁻¹), T₃ = (RDF + B @ 1.0 kg ha⁻¹), T₄ = (RDF +B @ 2.0 kg ha⁻¹), T₅ = (RDF +B @ 2.5 kg ha⁻¹). Observation related to the effect of treatments on urdbean, were recorded on growth attributes (plant height, no of leaves, no of nodules number of branches) The result revealed that with the application of boron (T₄- RDF + B @ 2.0Kg ha⁻¹) the maximum plant height (28.16 cm), no of leaves (48.50) no of branches (15.12)& no of nodules (15.33) was obtained which was significantly higher from treatment T₀,T₁,&T₅.The yield of grain (11.90qha⁻¹) and stover (16.81 qha⁻¹) was also higher with the treatment T₄.on yield attributes (pods per plant, test weight, grain and stover yield). On the basis of above results be concluded that application of boron is essential for better growth and yield of urdbean as compared to without boron application.

Keywords

Boron, Urdbean,
Growth attributes,
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Introduction

Urdbean [*Vigna mungo* (L.) Hepper] is one of the important pulse crop grown throughout the country during rainy season although in some instances it is also grown during zaid season. It is a self-pollinated leguminous crop which contain 24 % protein, 60 % carbohydrate, 1.3 % fat, 3.2 % mineral, 0.9 % fiber, calcium, phosphorus, iron and small

amount of vitamin B complex. Being a short duration crop, it fits well in various multiple and intercropping systems. After removing pods, its plant may be used as good quality green or dry fodder for animal. Being a leguminous crop, its dual role in providing protein rich seeds and improving soil fertility by adding nitrogen in the soil is well known. Urdbean share 13 percent of total area under pulses and 10per cent of their total production in our country. This crop is extensively grown



PHOSPHORUS FRACTION AND THEIR RELATIONSHIP WITH PHYSICOCHEMICAL PROPERTIES OF SURFACE SOIL OF VARANASI RESION(U.P.)

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ABSTRACT

A lab study was conducted to fractionate the soil P and find the relationship of different P fraction with physicochemical properties of surface soil of Varanasi region (U.P.) in the laboratory of agricultural chemistry and soil science department Udai Pratap college Varanasi. Most of the soils were light textured Soils from seven different region were collected and analyzed for phosphorus (P) fraction. The soils were neutral to slight alkaline in nature. The electrical conductivity (EC) ranged from 1.46 to 3.50 dS/m. The bulk density varied from 1.18 to 1.46 Mg/m³. The organic carbon values ranged from 0.50 to 0.75 %. The highest value was observed in DLW in surface soils. The distribution of the different forms of the phosphorus fraction was as Saloid-P (23.43 to 44.62 ppm), Al-P(10.75 to 20.02 ppm), Fe-P (6.96 to 13.4 ppm), Ca-P (80.97 to 115.78 ppm), reductant soluble-P (10.68 to 27.70 ppm), occluded-Al-Fe-P (13.02 to 26.75 ppm), organic-P (81.41 to 172.32ppm) with total phosphorus(270.75 to 383.84ppm) in different surface soils. The highest amount of Saloid -P, Ca-P, and lowest of Fe-P, Al-P, Organic-P. Among the different P fractions Ca-P was dominant fraction followed by saloid-P, reductant soluble-P, Al-P and Fe-P.

Key words- Phosphorus fractionation, Calcium, Fe, Al

Introduction:

Phosphorus is one of the essential plant nutrients for plant growth and is of particular interest in highly weathered tropical and sub-tropical soils (Brady and Weil, 2002). Phosphorus plays an important role as a structural component of the cell constituents and metabolically active compounds. It is a constituent of sugar phosphate viz. ADP, ATP etc., nucleic acid purine, pyrimidine etc. and various coenzymes. In combination with different organic acids, phosphorus forms esters, phosphatides and phospholipids. As phosphoric ester of Inositol, phosphorus is a major component of phytine. Besides, phosphorus play an important in energy transformation and metabolic process of plants. The deficiency of phosphorus disturb the nitrogen metabolism and also results in an increased accumulation of free reducing sugars, suggesting an involvement of phosphorus in carbohydrate metabolism. Phosphorus is not reduced in plants but remains in its highest oxidised form. Phosphorus in soils almost exclusively occurs as orthophosphate ions. The



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Efficacy of gypsum application on soil physical properties of groundnut (*Arachis hypogaea* L.) in typical ustifluvents

Ramjeet Yadav, Manoj Kumar Singh, Shriman Kumar Patel, Mamta Kumari, Sneha, Ajeet Kumar, Santosh Kumar, Shalini Kumari, SN Yadav, PK Yadav and RP Singh

Abstract

The field experiment was conducted at the experimental farm of Udai Pratap Autonomous College, Varanasi (U.P.) to evaluate the response of applied major nutrient with gypsum on physical properties in test crop field. The study was carried out with five treatments and four replications in randomized design. The results revealed that combined application of NPK @ 25:50:20 kg ha⁻¹ and T₄G₄₀₀ kg ha⁻¹ of gypsum in the soils significantly reduced soil dry bulk density by about 6.93% when compared to the control. The significantly highest soil particle density in 4.57 g cc⁻¹, pore space 11.47%, hydraulic conductivity 8.46, infiltration rate 17.37 and water stable aggregates were found in plots with a combination of NPK and gypsum at @ 25:50:20 kg ha⁻¹ and T₄G₄₀₀ kg ha⁻¹ respectively. The significant treatment differences on soil mechanical and physical properties of the study soil due to effect of the treatments could be attributed to the ability of Ca and S applied via gypsum to flocculate soil particles. Thereby, creating an enabling to better soil physical properties, infiltration and aeration for proper growth and quality of groundnut.

Keywords: gypsum, groundnut, physical properties of soil

1. Introduction

Groundnut (*Arachis hypogaea* L.) is a very important crop in the tropics and subtropics. It has a high content of edible oil, which ranges from 50 to 65% Taira (1985) [57] Boye-Goni *et al.* (1990) [8] and protein content ranging from 25 to 35% De Waele and Swanevelde (2001) [12] making it a very popular human food and source of cheap protein. In recent days there is mounting interest in diversified agricultural production systems to obtain improved crop protection, increased productivity and profitability offered by many cropping systems. This may be due to some of the established and speculated advantages for intercropping systems such as higher yields, greater land-use efficiency and improvement of soil fertility through the applications of gypsum (Ofori and Stern, 1987) [39]. Groundnut is traditional crops, like pearl millet, maize and sorghum, and also with pigeon pea in groundnut-growing areas of India by marginal and sub-marginal farmers during rainy season (Reddy *et al.*, 1980) [44]. Groundnut is grown mostly on light-textured soils ranging from coarse and fine sands to sandy clay loams with moderately low amounts of organic matter (1 – 2%) and good drainage (Henning *et al.*, 1982). The well-drained soils provide good aeration for the roots and nitrifying bacteria. Groundnut does not grow well in soils with a high-water retention capacity (Stalker, 1997), and grows best in slightly acidic soils with optimum pH ranging from 5.5 to 6.2 Gibbons (1980) [20]. Gypsum is a soluble source of the essential plant nutrients, calcium and sulfur, and can improve overall plant growth. Gypsum amendments can also improve the physical properties of some soils (especially heavy clay soils). Such amendments promote soil aggregation and can help prevent dispersion of soil particles, reduce surface crust formation, and promote seedling emergence, and increase water infiltration rates and movement through the soil profile. It can also reduce erosion losses of soils and nutrients and reduce concentrations of soluble phosphorus in surface water runoff. Application of gypsum can reduce dispersion and promote flocculation of soils. Flocculation is a necessary condition for the formation and stabilization of soil structure. This increases water infiltration and percolation Norton (2008) [8] thus reducing soil erosion and improving water quality. Gypsum helps reduce the dispersion of the clay that leads to surface crust formation and also slows the rate of surface drying (Norton and Rhoton, 2007; Rao and Shaktawat, 2001) [7, 43].



Yield attributes and yields of Rice (*Oryza sativa* L.) Under Lateritic Soil of Jharkhand in Response to Silicon Sources and Levels

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ABSTRACT

Diverse silicon (Si) sources have been reported in terms of their efficacy to improve rice yield. Besides, it is critical to apprehend the efficiency of different silicon sources and their levels for judicious plant uptake and its performances in different types of soils. In this point of view, field experiments were conducted during kharif season of 2017-18 and 2018-19 to assess the effect of different silicon sources and levels on yield attributes and yields of rice (*Oryza sativa* L.) under lateritic soil of Jharkhand. Silica was applied at the rate of 0, 50 and 100 kg Si ha⁻¹ through Calcium Silicate, Fly Ash and Paddy Straw. The results indicated that the yield attributes and yields were significantly affected by the sources and levels of Silicon. Application of calcium silicate @ 150 kg Si ha⁻¹ was found most effective followed by Paddy Straw @ 150 kg Si ha⁻¹ followed by Fly Ash @ 150 kg Si ha⁻¹ compared to control (RDF). The highest yield attributes and grain and straw yield were found with calcium silicate @ 150 kg Si ha⁻¹ in combination with RDF. Accordingly different treatments could be arranged in the order T₄>T₁₀>T₇>T₃>T₉> T₆>T₂>T₈>T₅>T₁. Si application at the level 150 kg Si ha⁻¹ along with RDF would help in the sustainable production of rice in the lateritic soil of Jharkhand.

Keywords: Rice, Silicon, Yield attributes, Yields

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INTRODUCTION

With around 154 million hectares of area, rice is one of the vital cereal crops in the world. Rice is the key source of calorie intake and primary food for more than three billion persons in the world [1, 2]. Need for rice is gradually increasing due to rise in population of the world. Asian nations are the leading consumer of rice where more than 1.3 billion people consider rice as staple food [3].

Rice is considered as silicon (Si) accumulating plant, and application of Si fertilizers rise the straw and grain yield through increasing photosynthesis and plant growth [4]. Si is also recognized for its importance in alleviating the adverse stress effects on various plant species [3]. Silica is one of the common elements in the earth's crust and plant's ash [5] and is second most abundant element in soil, being present in the form of silicate or aluminum silicate [6]. It may be easily absorbed into root system from soil solution, where it is found in the form of monomeric or monosilicic acid (H₄SiO₄) [7, 8]. Soils of tropical and subtropical areas are generally low in plant available Si [9] and Si content in red soils (highly weathered soil) of tropical zone may be less than 1% because of immensely active desilicification and fersialitization processes [10]. In various countries Si fertilizer has been used for improving yield of rice [11]. About 20 kg/ha² SiO₂ is being removed from soil to yield each 100 kg brown rice [3]. Various farmers disseminate Si from fields through eliminating straw residues with harvest and exogenous application of Si in rice cultivation is often overlooked. This recommends that Si may become a yield-limiting element for rice production; hence, addition of Si fertilizer might be crucial for economic and sustainable rice production system [12]. There are various Si sources for agricultural use, which range from natural minerals to chemical products and



REGULAR ARTICLE

Evaluation of Growth Parameters of Rice (*Oryza sativa* L.) under Lateritic Soil of Jharkhand in Response to Silicon Sources and Levels

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Keywords: Growth Parameters, Rice, Silicon, Levels, Sources

ABSTRACT

Numbers of silicon (Si) sources have been reported in terms of their effectiveness to improve rice growth and yield. Moreover, it is very critical to understand the efficiency of different silicon sources and their levels for satisfactory plant uptake and its performances in various types of soils. In this point of view, field experiments were conducted during *kharif* season of 2017-18 and 2018-19 to assess the effect of different silicon sources and levels on growth parameters of rice (*Oryza sativa* L.) under lateritic soil of Jharkhand, India. Silica was applied at the rate of 0, 50 and 100 kg Si ha⁻¹ through Calcium Silicate, Fly Ash and Paddy Straw. The results indicated that the growth parameters were significantly affected by the sources and levels of Silicon. Application of calcium silicate @ 150 kg Si ha⁻¹ was found most effective followed by Paddy Straw @ 150 kg Si ha⁻¹ followed by Fly Ash @ 150 kg Si ha⁻¹ compared to control (RDF). The highest growth parameters were found with calcium silicate @ 150 kg Si ha⁻¹ in combination with RDF. Accordingly different treatments could be arranged in the order T₄>T₁₀>T₇>T₃>T₉> T₆>T₂>T₈>T₅>T₁. Si application at the level 150 kg Si ha⁻¹ along with RDF would help in the sustainable production of rice in the lateritic soil of Jharkhand.

1. Introduction

With approximately 154 million hectares of area, rice is one of the most essential cereal crops in the world. Rice is the key source of calorie intake and primary food for more than three billion persons in the world (Datta et al., 2017; Ullah et al., 2017). Requirement for rice is gradually increasing due to rise in population of the world. Asian nations are the leading consumer of rice where more than 1.3

billion people consider rice as staple food (Cuong et al., 2017). Rice (*Oryza Sativa* L.) is the most important crop in India and it occupies 22.15 per cent of gross cropped area of the country, contributes 40.86 per cent of total food grain and 44.51 per cent of total cereal production (Ministry of Agriculture and Farmers Welfare, Govt. of India, 2018-19).

Rice is considered as silicon (Si) accumulating plant, and application of Si fertilizers increase the straw

Original Research Article

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Assessment of Genetic Diversity in Rice Germplasm (*Oryza sativa* L.) using SSR Markers

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ABSTRACT

Keywords

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Thirty eight rice accessions were analyzed to evaluate the genetic polymorphism and identification of diverse parents using simple sequences repeat (SSR) markers. These accessions showed significant phenotypic variation for all the characters studied. A total of 61 alleles were detected by 11 polymorphic markers showing highly polymorphic across all accessions with an average of 5.54 alleles per polymorphic marker. Five of the markers RM324, RM171, RM31, RM24, RM30 produced maximum 6 alleles. The PIC value ranged from 0.275 to 0.751 with a mean PIC of 0.633 and Markers RM31, RM336, RM30 and RM280 were the most informative primers to discriminate among the accessions on the basis of highest PIC of 0.751, 0.735, 0.731 and 0.719, respectively. The cluster analysis showed that these accessions grouped in to seven clusters in which cluster IIB had maximum 8 genotypes followed by cluster IA-1 (7 germplasms) and cluster IA-2 (6 germplasms). While, highest dissimilarity coefficient value was observed between the cultivar cultivar C-3 and LAL KHADHA. These accessions were showing wide genetic divergence among the constituent in it and may be directly utilized in hybridization programme for improvement of yield related traits.

Introduction

Rice is the life and the prince among cereals as this unique grain helps to sustain two thirds of the world's population (Bisen *et al.*, 2019). The rice accessions are a rich reservoir of

useful genes that rice breeder can harness for rice improvement programme and the genetic variability exists among rice accessions leaving a wide scope for crop improvements (Rashmi *et al.*, 2017; Singh *et al.*, 2015). Genetic diversity is a pre-requisite for any



Genetic Analysis of Selected Mutant Lines of Aromatic Rice

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Abstract: The study was conducted to evaluate yield and yield attributing traits in M₁ generation of two aromatic rice cultivars, Pusa Basmati 1 and Kalanamak. The traits like plant height, days to flowering, number of panicle bearing tillers per plant, number of grains per panicle, grain weight per panicle, days to maturity, amylose content and gel consistency had higher values of heritability in both varieties. High heritability combined with high genetic advance for number of panicle bearing tillers per plant, number of grains per panicle and grain weight per panicle in the mutant lines of both the cultivars Pusa Basmati 1 and Kalanamak advocated that selection would be effective for these traits.

Keywords: Aromatic rice, Macromutations, Gamma rays, EMS, Genetic analysis

Rice (*Oryza sativa* L.), one of the most important staple food crops in the world is grown in an area of 159.40 m ha with production of 696.3 m t globally. However, 88.95% area of world rice cultivation is concentrated in the Asian countries which contribute 90.4 per cent of the rice production. India, is the second largest rice growing country in the world with a production of 106.1 million tonnes in about 44.6 m ha area with an average productivity of 2.38 t/ha (FAO 2016). Mutation breeding is relatively a quicker method for the crop improvement and many physical and chemical mutagens have been used for induction of useful mutations in rice (Singh and Singh 2003, Elayaraja et al 2005). There is ample scope of mutation breeding application in augmenting and developing varieties/lines/genotypes which may be included in the germplasm of rice for aromatic rice improvement programme. The primary objective of this research work was to enhance the frequency and spectrum of mutations and also to increase the incidence of viable mutations. Hence a programme of mutation breeding was taken up to isolate superior mutant lines with improved yield and/or quality traits in two cultivars of aromatic rice (*Oryza sativa* L.), namely, Pusa Basmati 1 and Kalanamak.

MATERIAL AND METHODS

The two aromatic rice varieties, viz., Pusa Basmati 1 and Kalanamak were employed as experimental materials. Pusa Basmati 1 was derived from a cross of Pusa 150 x Karnal local. It is a semi dwarf, medium flowering, long size grain, awned panicle, mildly scented, high gelatinization temperature, soft gel and intermediate amylose. Kalanamak is a non-basmati scented rice variety grown primarily in the

Tarai area adjoining Nepal and its husk is black. It is a successful adapter to *usar* soils characterised by higher salt concentration and high pH. Three hundred pure, uniform, healthy and dry (12% moisture) seeds for each treatment of Pusa Basmati 1 and Kalanamak were irradiated with gamma rays at five doses, viz., 10, 20, 30, 40 and 50 kR at NBRI, Lucknow. Two hundred fifty seeds were sown in the field and remaining fifty seeds were kept for laboratory observations. EMS solution with different concentrations, i.e., 0.2, 0.3, 0.4 and 0.5 per cent were prepared by mixing appropriate volume of the chemical ethyl methane sulphonate (EMS) and phosphate buffer (pH 7.0). Three hundred pure, uniform, healthy and dry seeds (12% moisture) were subjected to presoaking in distilled water for 6 hours at room temperature. The soaked seeds were then transferred to EMS solution of different concentrations in research lab of the department. The seeds were kept in EMS solution for 6 hours and seeds were given intermittent shaking throughout the period of treatment to maintain uniformity. The mutagen solution was drained out. The treated seeds were then washed in running tap water for 1 hour to remove residual chemical from the seeds, if any.

The combination treatment of gamma rays and EMS was also done as described earlier. For this, the gamma ray treated seeds were soaked in distilled water for six hours and then treated with EMS solution of 0.2% concentration followed by washing in running tap water for 1 hour. For each combination treatment, 300 seeds were used. The 250 washed seeds of each treatment were then sown in experimental field at Research Farm of UP College (25° N latitude and 82° E longitude) to raise M₁ generation along with



Evaluation and Characterization of Selected Mutant Lines of Aromatic Rice in M_5 generation

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Abstract: The mutation breeding is reckoned to enlarge the frequency and spectrum of mutations for incidence of viable mutations as an approach towards directed mutagenesis. A study was made to evaluate yield and yield attributing traits and to characterize selected mutant lines in M_5 generation of two aromatic rice cultivars namely Pusa Basmati 1 and Kalanamak after treatment with gamma rays and EMS alone and/or in combinations at Research Farm, Udai Pratap College, Varanasi. Various types of macro mutations were observed in M_5 generation. A total of 21 types of morphological mutants were identified and selected in M_5 generation in Pusa Basmati 1 and Kalanamak. These mutants were dwarf, semi dwarf, tall, early, sterile and high yielding. Of these 9 mutants from Pusa Basmati 1 and 12 from Kalanamak were identified as true breeding for plant morphology and maturity characters in M_5 generation. The induction of useful mutant lines for earliness, large panicle, more number of grains per panicle and higher grain yield per plant derived from both the varieties could be of immense significance in the improvement of aromatic rice. Many macromutants showed a significant improvement in yield and yield components as compared to their parents.

Keywords: Aromatic rice, Macromutations, Gamma rays, EMS

Rice serves as a main staple food for more than half of the world population. The productivity of this crop has direct impact on global food security (Rashid et al 2019). It is a premier crop, in terms of its calorie contribution to human diet and monetary value of food production in developing world (Singh et al 2014). Globally, it occupies more than 146 million ha land which produces approximately 685 million tonnes of grain annually (RMM-USDA 2015). Aromatic rice constitute a small but an important sub-group of rice. The use of physical and chemical mutagens or combination of both has been an important tool for the increase of variability in agronomic traits in cereals including rice (Baloch et al 2002, Domingo et al 2007, Chakravarti et al 2013, Jain et al 2015). The primary objective of this research work was to enhance the frequency and spectrum of mutations and also to increase the incidence of viable mutations.

MATERIAL AND METHODS

The two aromatic rice varieties, viz., Pusa Basmati 1 and Kalanamak were employed as experimental materials. Some of the important characteristics of these cultivars may serve as useful criteria for judging the relative merits of induced mutants, if any. Pusa Basmati 1 was derived from a cross of Pusa 150 x Karnal local. It is a semi dwarf, medium flowering, long size grain, awned panicle, mildly scented, high gelatinization temperature, soft gel and intermediate

amylose. Kalanamak is a non-basmati scented rice variety grown primarily in the Tarai area adjoining Nepal particularly in the districts of Siddharthnagar, Santkabirnagar and Basti and in small pockets in eastern Uttar Pradesh, and is named because its husk is black. It is a successful adapter to *usar* soils characterised by higher salt concentrations and high pH. The name itself 'namak' means salt signifies this quality. Three hundred pure, uniform, healthy and dry (12% moisture) seeds for each treatment of aromatic rice Pusa Basmati 1 and Kalanamak were irradiated with gamma rays at five doses, viz., 10, 20, 30, 40 and 50 kR at NBRI, Lucknow. Two hundred fifty seeds were sown in the field and remaining fifty seeds were kept for laboratory observations. EMS solution with different concentrations, i.e., 0.2, 0.3, 0.4 and 0.5% were prepared by mixing appropriate volume of the chemical (Ethyl Methane Sulphonate) in phosphate buffer (pH 7.0). Three hundred pure, uniform, healthy and dry seeds (12% moisture) were subjected to presoaking in distilled water for 6 hours at room temperature. The soaked seeds were then transferred to EMS solution of different concentrations in research lab of the department. The seeds were kept in EMS solution for 6 hours and seeds were given intermittent shaking throughout the period of treatment to maintain uniformity. The mutagen solution was drained out. The treated seeds were then washed in running tap water for 1 hour to remove residual chemical from the seeds, if any.

Studied the Variation in Feed Consumption in Buffaloes in Different Seasons

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Abstract: *An experiment contribution of cows and buffaloes milk in unorganized sectors in eastern Uttar Pradesh, general, and selected block of rural areas, in particular is not clear. About 50 percent of total bovine are underfed or overfed in rural areas mostly due to lack of scientific knowledge for feeding, breeding, management and veterinary problems. The present study was conducted during March 2002 to April 2004 in villages of selected blocks of Azamgarh District to assess the economic performance of buffaloes during different seasons in different categories of farmers. The choice of block was based on the state Department of District Azamgarh and BLAF Center are working for popularization and up lift of dairy animals in the locality, beside, extension training center is also located near the all blocks, which acts as a catalytic agent in promoting the development in entire block area.*

Key words: *Buffaloes, feed consumption, variation and seasons.*

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I. Introduction

Milk production is most efficient system as for as conversion efficiency of protein and energy is concerned. In order to achieve economical milk production, emphasis has been on improvement of milk production traits, growth rate for early maturity and to augment reproduction efficiency. Adequate and scientific feeding is also equally important. There is a wide gap of feed availability for animal their requirement due to continuous increases in live stock population and shrinking land resources for forage production due to increasing demands for production of food grain for ever growing human population.

Increased availability of feed and fodder are of crucial significance to provide support for targeted increase milk production. Due to increasing pressure of human population on our land, there is a hardly any scope for increasing area under pasture and cultivated fodders. Out of total requirements of 25.4 mt of concentrates, 350 million ton of dry fodder and 308 million ton of green fodder, only 16 mt of concentrate, 300.5 mt of dry fodder and 261 mt of green fodder are available. To fulfill the gap, there is a need to make greater use of agro industrial byproducts as a animal feed and create newer feed resources.

II. Materials and Methods

Selection of villages during the survey a list of villages in different block in which adequate number of buffaloes are maintained was prepared in consultation with Veterinary Hospital, BIAF and BDO/ADO center located in the area. From such list, 250 (10x5) farmers from 25 villages from 5 blocks were selected randomly for the present study name of blocks viz. Atroulia, Jahanaganj, Palhni, Lalganj and Phool pur.

Selection of former after selection of villages, the list of families' buffaloes was prepared. Then 250 live-stock owners were selected randomly. In the selected villages, in different five types of farmers viz. large, medium, small, marginal and land less family to family enumeration was first carried out in order to secure proper information for selection of representative samples of producing unit.

The information collected from 250 families. The selected milk produce family was interviewed and necessary information collected through carefully pre designed questionnaires by survey methods throughout the year. Every milk producer family having buffaloes were interviewed every month during the lactation period under study area to ensure the availability of following information viz. number buffaloes maintained by the families, lactation length and yield, calving interval, initial investment, nutritional status of animals maintained by different of farmers, production of milk, quality of milk in respect to fat, protein and SNF, price of milk sold and cost of milk production.

Selection of farmers in each village included as per their size or land holding as under: large more than 4 ha, medium 2-4 ha, small 1-2ha, marginal less than 1 ha, landless 0 ha. Collection of data quantity of feed and fodders offered to buffaloes during 24 h were recorded by actual weighing. The body weight of animals was calculated (per animals) categories wise from the body measurement by using Minnesota formula (Verma, 1992).

Impact of managerial practices on the performance of cattle farming at organized dairy farm

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ABSTRACT : Cow rearing is a most popular enterprise for milk production. Cows are steady and major sources of milk. The experiment was conducted at government cattle farms in Arajiline Block of Varanasi District. The different data were collected related to certain factors, viz., type and status of the herd size, general management practices like breeding, feeding, housing and health care etc. may affect the production of cow. Study had concluded that provide proper housing management practices for increasing the production of cow and milk and provide superior germ plasm and adopt new technology of breeding for improving the cow production.

Key Words : Cattle, management practices, dairy farm, breeding, nutrition, disease control measures.

Cow has been domesticated to improve the socio-economic condition of mankind, under the below poverty line and having good status of living of life. Most of these species thrive well under a breed of agro-climatic condition with a certain minimum management and nutritional requirements are met with. They are efficient producer of milk and drafting with ploughing as compared to other livestock species. Foreign and cross-bred of cow are used to commercial production of milk and milk product. Cow alone account for about 58 per cent of the total livestock population. The national economy is closely related with agriculture and livestock. It is therefore, an idea of great importance that the cows are maintained in good health and provide proper management, housing and hygiene. The productive potential of cows stock are controlled by three principle factors, (i) genetic makeup, (ii) Nutritional and (iii) environmental including the climatic condition. In addition to the health status of animals, is profound importance. The stocks when in good health are able to make best use of the genetic potential and their nutrition. In Current years, there has been pronounced trend toward adopting intensive method of raring livestock. The universally are feeding, breeding, weeding and heeding. Both the male and female selected for breeding should have be superior genetic merit. They should be known potentialities and possess desirable qualities. Weeding and culling aims at cutting the un-economic animal through castration so that they are prevented from reproducing and do not unbeneficiary strain the resources of the owner. Each animal should be fed on a balanced ration calculated on body requirement for maintenance and production. Both over-feed-

ing and under-feeding at the time of calf stage are un-economic, the former being wasteful and the latter deficient apart from providing more costly in long run. Good animal management and general supervision including housing, care and maintenance of proper hygiene condition in day today. The basic requirements for the welfare of cow are provision of adequate accessible fresh water and nutritionally adequate food as required. Provision of adequate ventilation and suitable environmental temperature, freedom of movement and availability to stretch the body and protection from injuries and disease in case of open paddock.

Materials and Methods

The Arajiline block which has one government cattle farm namely; (i) Sahanshahpur, has been selected for the purpose of this study. This block is situated 30 km away from Varanasi district in hilly area. Government cattle farm Sahanshahpur Arajiline Varanasi maintained proper records and collection of data is based on these records only. The Department Office collected farm records to different manage mental practices. Total milk production/day 180 L./day, total milking cow 44, total dry cow 24, total heifer 66, total calf 28, total cultivated land 60.00 ha, Feeding pattern Twice daily, Service system natural, milking method full hand method. The record made available for information and the analysis of work are as follows: Herd Size, Housing Management, Breeding Management, Feeding Management, Production of Cow, Health and Hygiene. These data were put under processing and analyzed. The results are presented scientifically in the form of different tables, graphs, appendices, etc.

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Genetic diversity and relationship among North East Hill (NEH) goats

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ABSTRACT

Genetic diversity and relationship among three goat populations i.e. Singharey, Sikkim Black goat and Long hair Nagaland goat also known as Sumi-Ne of North eastern hill region. Fifty blood samples were studied from each population and tested with a battery of 25 and satellite markers. Number of alleles observed was 116 (Sumi-Ne), 182 (Singharey) and 124 (Sikkim Black). Average numbers of alleles observed were 5.04 ± 0.38 (Sumi-Ne), 7.91 ± 0.57 (Singharey) and 5.39 ± 0.30 (Sikkim black goats) and average effective numbers were 2.57 ± 0.28 , 3.49 ± 0.32 and 2.77 ± 1.68 , respectively. Singharey had relatively more private alleles but with comparatively lower frequency. The average observed and expected heterozygosity was 0.34 ± 0.04 and 0.49 ± 0.05 in Nagaland goats, 0.50 ± 0.04 and 0.64 ± 0.03 in Singharey and 0.42 ± 0.33 and 0.57 ± 0.40 in Sikkim black goats. Average F_{IS} , F_{IT} , F_{ST} were 0.27 ± 0.04 , 0.39 ± 0.03 , 0.15 ± 0.03 , respectively. All the three populations showed absence of bottleneck (reduction in effective population size). Analysis of molecular variance revealed that 39% of the total genetic diversity existed among the individuals within populations and only 18% of the total genetic diversity accounted for differences among populations. Sumi-Ne showed similar genetic distance (0.636) from the Singharey and Sikkim Black goat, whereas, Singharey and Sikkim Black were genetically close. Compared to other Indian goat breeds, all the three NEH populations were far distanced from Berari, Black Bengal, Bundelkhandi, Ganjam, Jharkhand Black, Konkan Kanyal and Kutchi. In the neighbour joining diagram the three goat populations were plotted separately. Considering the geographical and genetic identity of NEH goats, conservation and improvement programmes may be formulated accordingly.

Key words: Genetic diversity, Heterozygosity, Microsatellites, NEH goats, Relationship

Genetic diversity is an important parameter for formulating the breeding and improvement programmes for any species. Goat is not the exception where diversity is exhibited more by their phenotypes and performance traits. Genetic polymorphism forms the basis of this diversity. Type of product and its production depends upon the climate of their habitat. Chevon production is the main utility whereas other products come as additional utility to the farmers. Goats reared in cold climate of North region yield long silky fibre apart from the meat. Goats of North Western region in India, are known for their milk production whereas those of Eastern and Southern region are good meat yielder and highly prolific. Loss/dilution of a breed due to any reason results in the loss of genetic variability from the gene pool. Genetic variability helps the population to survive and perform better under varied climatic conditions. Genetic diversity in Indian goat breeds has been studied by many workers (Dixit *et al.* 2012; Mishra *et al.* 2013, 2015;

Verma *et al.* 2015). As of today, 34 goat breeds are registered by ICAR-NBAGR (2018). This includes LHNG/Sumi-Ne from Nagaland and Assam hill goat from Assam. Goat population of NEH region of India is about 4.37 million and the population in Sikkim and Nagaland was 1,13,364 and 99,350, respectively (Livestock Census, 2012). North East hilly goats (Singharey goat and Sikkim Black goat from Sikkim and Sumi-Ne from Nagaland) have been considered for study (Fig. 1). In this study, microsatellite markers which are co-dominant in nature have been used to analyze the genetic diversity among these populations.

MATERIALS AND METHODS

Blood samples (50) were collected from genetically different animals of each population from different locations. DNA was isolated by standardized phenol-chloroform method using protocol of Sambrook *et al.* (1989). After quality check DNA was diluted appropriately (50 ng/ μ l) in MiliQ water. A battery of 25 microsatellite labelled markers (Table 1) was utilized to generate allelic data. Each forward primer was tagged on the 5' end with one dye out of four dyes (FAM-Blue, VIC-Green, NED-Yellow, PET-Red) supplied by Applied Biosystems, UK.

Amplifications were conducted in a 25 μ l reaction

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Evaluation of genetic diversity in long hair Nagaland goat Sumi-Ne

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Key words: Allele, Diversity, Goats, Microsatellite, Nagaland

North east hilly region of India is home to diverse animal genetic resources including cattle, buffalo, sheep, goat, pig, equine, yak, mithun etc. About one-sixth of Nagaland is covered by tropical and sub-tropical evergreen forests including palms, bamboo and rattan as well as timber and mahogany forests which serve as shelter to many of these genetic resources. The state is mostly mountaineous except those areas bordering Asom valley. Goat population of Nagaland is about 99,350 (LC 2012) and contributes only 2.27% to the goat population of North East Hill region which is about 4.37 million. This small proportion of Nagaland goats is having a unique germplasm with long hair and is cited in literature as Nagaland long hair goat (LHNG or NLHG). These goats are mostly reared by Sumi tribe people of Nagaland following the extensive and semi-extensive management system. The long hair obtained from these goats is of commercial utility for the tribal people. An adult goat can yield fibre ranging from 187 to 207 g with mean 197.33 g. The fibre length ranges from 10 to 18 cm with mean 15.5 cm whereas fibre diameter ranges from 210 to 250 micron with mean 225.56 micron (Sheetal 2016). Recently, this goat population has been registered as 28th goat breed of India by the name 'Sumi-Ne' with the accession number 'INDIA_GOAT_1400_SUMI-NE_06028'. An attempt has been made to characterize these goats phenotypically and genetically. Here, we present the information generated on genetic diversity estimated using microsatellite markers.

Visits were taken to different parts of Zunheboto, Tuensang, Kiphire, Phek and plain area of Dimapur districts, apart from Peren, Kohima, Woka, Mokochung, Longlen, Mon of Nagaland to collect information on goats. Although, study was carried out on 255 animals of 42 different flocks but as per standard protocol recommended by FAO for estimating the genetic diversity, 50 blood samples were

collected and 25 microsatellite markers were used. To ensure the presence of genetic diversity, the blood samples were collected from the animals of different parentage belonging to 10 different flocks existing in Zunheboto, Satami, Suruhato, Tokiye, Astotown, Xuivi villages. The sampling areas were mainly from Zunheboto and Tuensang districts where pure breed animals are found. Blood samples were drawn using EDTA coated vacutainer tubes taking all hygienic precautions. DNA was isolated following standard procedure of Sambrook *et al.* (1989). PCR was carried out to amplify the DNA using standard conditions followed by us for other goat breeds (Verma *et al.* 2015a, b, Mishra *et al.* 2017, Shivahre *et al.* 2017). PCR amplification were conducted in a 25 µl volume with 2.5 µl of 10× PCR buffer, 0.5 µl dNTP (200 µM), 0.5 of each primer (10 pmol) and 0.25 µl of Taq polymerase (Sigma). Of the 25 microsatellite markers, 23 got amplified and were used to study the allelic variation (Table 1). Microsatellite genotyping was carried out with automated DNA sequencer (ABI 3100 Avant) with Liz 500 as internal lane standard. DNA fragment size details were estimated from the electropherograms using Gene mapper software (version 3.0) of Applied Biosystem, USA. Allele numbers, heterozygosities (observed and expected), Hardy Weinberg equilibrium test, and Shanon information index were calculated using Pop Gene software, v 1.32 (Yeh *et al.* 1999). Polymorphic information content for each locus was calculated according to Botstein *et al.* (1980). F statistics were determined using F-stat (Goudet 2002). Tests for deviation from Hardy Weinberg equilibrium were conducted. To detect the genetic bottleneck in the long hair goat population, two tests namely 'Sign test' and 'Wilcoxon sign rank test' were employed under three microsatellite evolution models like infinite allele model (IAM), stepwise mutation model (SMM) and two phase model (TPM) of mutation. The graphical presentation of mode shift indicator of Luikart and Cornuet (1998) was also attempted.

The goats are reared by tribal people mainly for meat, coarse fibre and skin. The long hair goats are mainly found in Zunheboto district whereas their number is comparatively less in other districts. The long hair goat, as the name indicates, is distinguished from other goat populations of NEH region by the presence of long silky hair in males (Fig. 1). These goats are predominantly of black (head and

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A review of Post Harvest Management and value addition of horticultural crops: A source of income generation for the farmers of Easter Utter Pradesh

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Abstract

India harvested 223.089 million tonnes of horticultural produce from 20.876 million hectares of land in the 11th five year plan. The major crops contributing to it are fruits and vegetables (approx 204 million tonnes from 14.314 million hectares area). Horticulture sector contributing 30 percent to the India's agricultural GDP from 8.5 percent of cropped area. As the waste utilization technology are adopting in developed countries and the scales of economies of these technologies does follow in Indian conditions due to various factors. Therefore, there is a need for development of cost effective technologies for the production of value added products. Post harvest management of fruits and vegetables provides ample opportunities for value addition besides providing wealth from waste. Its effective utilization helps in reducing the cost of production of crops besides optimum utilization of biomass. A several process technologies used to utilize fruit and vegetables such as drying & dehydration, freezing, fermentation, extraction, etc., are some treatment examples that can be useful to recycling and upgrading waste of fruit and vegetable market.

Keywords: Horticulture, Post Harvest management, Post Harvest losses, Value Addition, Biomass, etc.

Introduction

The horticultural crops has the huge potential for development of wastelands through planned strategies, need comparatively less water than food crops, provide higher employment opportunity and environment-friendly. On the basis of nutritional security, fruits and vegetables have high potential of value addition that gives high foreign exchange earnings and is an important item of commerce as they have gained enormous market potential. Horticultural crops in Indian agricultural economy shared a significant role as it contributes 30% to the GDP from 11.73 % of its arable land area. Indian fruits and vegetable sector is the largest in the world next to China in terms of production with estimated food processing industry size of US\$ 70 billion as in 2012, India had the production of 257 million tons of food grain (rice, wheat, coarse grains and pulses), 75 million tons of fruits and 149 million tones of vegetables. India has very high post harvest losses of fruits and vegetables which reached to 30 to 40 per cent and only 2.2 % of the total production are under processing as compared to the other countries like USA and China which are far ahead than India in reducing the wastage and enhancing the value addition and shelf life of the farm products. Different organizations in India have been trying to find solution for serious issue related to post-



Competence of straw of various Wheat varieties (Strains) and new method of mushroom monolith preparation for cultivation of the *Pleurotus florida*

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ABSTRACT :

Our country has tremendous potential for cultivation of edible Mushroom due to the vast availability of agricultural by-product the main raw material for *Pleurotus florida* production six wheat varieties namely Hi-8759 Pusa tejas HD-4728 pusa malawi, HD-1605 Pusa ujala, HS-562, HD-3226 and HW-5207 (cow³) were tested for cultivation of *P. florida* by new method.

Key Words : *Wheat varieties, pusa, Pleurotus florida dextrose, Agar, Basidio corp.*

INTRODUCTION

Wheat straw a byproduct obtained after harvesting of wheat grains has an annual global production of 529 million tons (Govumoni et al 2013) wheat straw is composed of Internodes ($57 \pm 10\%$), Nodes ($10 \pm 2\%$), Leaves ($18 \pm 3\%$), Chaffs ($9 \pm 4\%$) and rachis ($6 \pm 2\%$) oyster mushroom (*Pleurotus florida*) is an edible mushroom that belongs to the subdivision, Basidiomycotina play an important role in nature by recycling carbohydrate through lignin degradation is achieved through enzymes. Oyster mushroom can be grown at temperature ranging from 20 to 28C⁰ and relative humidity (RH) 75-85% the best growing season is during March/April to September/October and lower regions from September/October to March/April. In the present study unchopped and chopped wheat straw were evaluated as substrate to improve the mushroom yield by using a strain of the species *Pleurotus florida*. To study also aims at identifying the best variety of wheat straw suited for *Pleurotus florida* cultivation.

CHALLENGES AND ITS REDRESSAL AT BOTTOM OF THE PYRAMID**Atul Pandey**Research Scholar, UP Autonomous College
MGKVP University, Varanasi, U.P.**Dr. Banarasi Mishra**Associate Professor, UP Autonomous College
MGKVP University, Varanasi, U.P.**Abstract**

For well above a billion people approximately 17% of humanity, per capita income is even less than \$1 perday. Even more substantial, the income gap between rich and poor is rising. According to the United Nations, the top 20 percent in the world accounted for more than 70 percent of total income in 1960. In 2000, that figure reached 85%. At the same time, the fraction of income accumulating to the poorest 20% in the world drop from 2.3 % to 1.1%. This dangerous inequity of wealth distribution strengthens the view that the people at Bottom of Pyramid cannot participate in the global market economy, even although they constitute the majority of the population. In fact, given its immense size, Tier 4 represents a multitrillion-dollar bazaar. According to World Bank predictions, the population at the bottom of the pyramid could be more than 6 billion over the next 35-40 years, because the majority of the world's population growth happens there. Economic and Social gap challenges at BOP are very necessary to be redressed because it can improve the life of more than a billion deprived people.

Key Words: Bottom of the pyramid, challenges, deprived, economic and social gap, redressed.

BOTTOM OF PYRAMID

At the topmost of the world economic pyramid are 75 to 100 million prosperous Tier 1 people from around the world (shown in Figure 1.) This is a multinational group composed of higher middle and upper income people in developed nations and the few rich elites from the developing nations. In the mid of the pyramid, in Tiers 2 & 3, are poor people in developed nations and the growing middle classes in developing nations, the main targets of MNCs' previous emerging-market strategies. Now let us consider the more than 4 billion people in Tier 4, at the bottom of the pyramid (BOP). Their annual per capita income based on purchasing power parity in U.S. dollars is less than \$1,500, the lowest considered essential to sustain a decent life. For well above a billion people approximately 17% of humanity, per capita income is even less than \$1 perday. Even more substantial, the income gap between rich and poor is rising. According to the United Nations, the top 20 percent in the world accounted for more than 70 percent of total

income in 1960. In 2000, that figure reached 85%. At the same time, the fraction of income accumulating to the poorest 20% in the world drop from 2.3 % to 1.1%. This dangerous inequity of wealth distribution strengthens the view that the deprived cannot participate in the global market economy, even although they constitute the majority of the population. In fact, given its immense size, Tier 4 represents a multitrillion-dollar bazaar. According to World Bank predictions, the population at the bottom of the pyramid could be more than 6 billion over the next 35-40 years, because the majority of the world's population growth happens there. The opinion that the bottom of the pyramid is not a worthwhile market also miss the mark to take into account the growing importance of the informal economy among the poorest of the poor, which by certain estimates accounts for 40 to 60 % of all economic action in developing nations. Most Tier 4 people live in rural communities, or urban slums and shantytowns, and they generally do not carry legal title or deed to their belongings

Women Entrepreneurship in India: Socio-Economical and Psychological Barriers

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Abstract

Purpose: The traditions are deeply ingrained in Indian society, where the entrepreneurial set up has been male dominated, educated Indian women will have a long way to go to acquire equal rights and position. Despite all of the social obstacles, Indian women stand out from the crowd and are praised for their accomplishments in their fields.

Design/ methodology/ approach: This research is descriptive and Based on the secondary data.

Research objective and implications: The objective of this study was to identify and analyze the impact of digitalization on women entrepreneurs and to highlight various opportunities and challenges that arise in this digital era for women who are already involved in entrepreneurial activities or planning to.

Keywords : Women Entrepreneurship, Gender Inclusion, Entrepreneurial tendencies, Gender Equality.

Introduction:

In the context of economic liberalisation and globalisation, women's entrepreneurship is gaining traction in India. The legislative and institutional platform for managing entrepreneurial abilities and providing vocation training and education has broadened the possibilities for women's economic independence. Women, on the other hand, make up only one-third of all businesses. Entrepreneurship is the act of starting a new business or revitalising an existing one in order to capitalise on fresh prospects. An entrepreneur is someone who starts a business. He looks for and responds to change. An entrepreneur has been defined in a variety of ways. Economists regard him as a fourth element of production, alongside land labour and capital.

In India, there are numerous successful business women entrepreneurs in both the social and economic spheres. They are doing quite well. In order to give skill training, vocational education, and entrepreneurial development to the developing labour force, the Indian government created the National Skill Development Policy and National Skill Development Mission in 2009.

Women's involvement in economic development is also being recognised, and initiatives are being taken to encourage women to start businesses. The resurgence of entrepreneurship is urgently needed, with a focus on educating women from all walks of life, as well as increasing understanding and consciousness among women to help them shine in the business world.

Literature Review:

Gayathridevi (2014), Clearly, female entrepreneurs have more to 'acquire' than their male colleagues. However, the socio-cultural milieu in which women are born and raised puts them at a disadvantage. Women lag behind men due to social customs, caste constraints, cultural restraints, and norms. As a result of their family orientation, limited mobility, and limited access to resources, they are mentally geared to fall into an entrepreneurial activity. They are, nevertheless, capable of overcoming these restrictions if given the opportunity, direction, and supervision.

The Emergence of a Fintech Ecosystem in India: Challenges and Outlook

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Abstract

Fintech is a type of technology that offers alternatives to traditional banking and non-banking finance services. Fintech (financial technology) is a new concept in the financial business. India is evolving into a dynamic environment that provides a platform for Fintech start-ups to grow into billion-dollar unicorns. Fintech in India is pursuing a variety of goals, from entering new areas to exploring global markets. The historically cash-based Indian economy has reacted favourably to the Fintech opportunity, which has been fuelled in part by an increase in e-commerce and smartphone adoption. The primary goal of this paper is to examine the opportunities and problems that exist in the fintech business. It describes the fintech industry's evolution as well as current financial technology (fintech) in the Indian finance sector. This study is qualitative as well as Descriptive in nature. secondary data has been used for the analysis.

Keywords: Financial Technology, Financial Services, Fintech Revolution, Cashless Economy, Financial Inclusion.

1. Introduction

Fintech is a relatively new term that has grown in prominence since its inception in early 2015. The word Fintech, Define as a blend of Technology in the delivery and use of financial services. Fintech is one of the fastest-growing technology segments in India, it is bringing innovation in various applications including loans, payments, stock trading, and credit scoring. As of 2020, India accounted for the highest fintech adoption rate (87%) and is the biggest destination for investment deals worldwide.

This word is frequently misunderstood as a solely technical and tech-savvy term. However, in reality, this phrase refers to the blending of financial services given by numerous clients with technological breakthroughs and innovations. FinTech is dominated by the United States, China, and India coming in third. Fintech is changing the financial services industry in India. India's fintech industry is the world's fastest expanding. According to the Financial Inclusion Data Index of the World Bank, just 53% of adult Indians held a bank account in 2014. At the time, about half of the adult population - several hundred million people - settled all financial transactions informally. This indicates a vast level of economic activity for a country the size of India that is just never recorded in official statistics like GDP or domestic consumption. (Guild, 2017) With a massive population distributed across several geographies and limited financial service coverage India's FinTech enterprises have a huge market and growth potential. The historically cash-based Indian economy has reacted favourably to the fintech opportunity, which has been fuelled in part by an increase in e-commerce and smartphone adoption.

In FY20, the Indian FinTech business was valued at \$ 50-60 billion dollars, and by 2025, it is expected to be worth \$150 billion dollars. It also established the circumstances for Fintech companies to onboard millions of new users to cashless payment platforms aimed at increasing financial inclusion, in concert with government policies. India's fintech startups are focusing on this underserved community by providing digital financial services. Cashless e-wallet system, such as Paytm, is the most popular, with 200 million users as of February 2017. (Guild, 2017)

As per Report of the Steering Committee on Fintech Related Issues 2019, In India, the payments and loans sectors have seen significant expansion. The RBI has released the Report of the Working Group on FinTech and Digital Banking, which highlights that payments sector innovations

Globalization and Conflict Resolution

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Abstract

It is beyond doubt that we live in a new and challenging era, and that we are trying to figure out the basic features of our world without enjoying the privilege of temporal distance that would allow us a better perspective. The paper considers the interplay between conflict and globalization, arguing that the interaction between globalization and conflict is complex. While much has been written on how globalization generates or accentuates conflict little has been written on how conflict and globalization interact to produce both positive and negative results. The theme of this chapter is that economic globalization is broadly consistent with U.S. international security and foreign policy interests. It facilitates integration, promotes openness, encourages institutional reform, and fosters a nascent international civil society. But shocks associated with rapid globalization, especially short-term financial flows can exacerbate political and social problems, foment instability. This article starts with one fundamental question about the changing reality of today: what is the relationship between globalization and conflict?

Keywords: temporal distance, interplay, accentuates, integration, openness, fasters, nascent, exacerbate.

Introduction

“Globalization” means a process of making something worldwide in scope. Limited versions of it have existed since ancient times. Means of transmission have included trade, conquest, study of the classics, and religious zeal. In the last two decades, however, globalization has intensified and accelerated social, political, economic, and cultural change in ways that add up to a difference in kind. This paper focuses on economic globalization and its relationship to national security. Economic globalization is spreading at an uneven pace, but wherever it develops, it has important security implications. It blurs national boundaries and erodes the power of nation-states, even as it extends their sovereignty into new areas. It changes regional and international power relationships, shifts the mixture of interests at stake, and redefines long-standing alliances and conflicts. It will greatly influence the shape, content, and legitimacy of the future global security order. For these reasons, the U.S. national security community has an important stake in U.S. international economic policy. Several potential threats described in Strategic Assessment 1995 have not come to pass and are unlikely to do so. Closed regional blocs have not emerged. Zero-sum rivalry in high technology, if it exists at all in a global economy, has clearly shown the United States to be a successful competitor and beneficiary. Foreign investment in key U.S. industries has not opened the door to threats and blackmail.

Asia’s economic and political turmoil stems primarily from domestic political and structural Weaknesses, but globalization subjected those weaknesses to unprecedented strains. While globalization spurred high growth rates in most of the region, it facilitated waves of short-term borrowing and investment in dubious projects. The financial sector was particularly weak and poorly regulated, and social safety nets were wholly inadequate to deal with the crisis. But the international community’s reactions made the situation worse. Unwise investors panicked and fled, and the IMF initially imposed unduly harsh policies. Drawing on this experience, the United States should attempt to channel economic globalization in ways that

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Impact of Receivables Management on Working Capital: A Study on Steel Authority of India Limited (SAIL)

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Abstract

This paper is an attempt to study the impact of Receivables Management on Working Capital. To accomplish this objective data have been collected from the annual reports of SAIL for the period from 2014-15 to 2018-19. The ratios which highlight the efficiency of receivables management viz., Receivables to Current Assets Ratio, Receivables to Total Assets Ratio, Receivables to Sales Ratio, Receivables Turnover Ratio, Average Collection Period, Working Capital Ratio and Profitability Ratio, have been computed. The study reveals that the receivable management of SAIL is efficient and showing significant impact on working capital and profitability.

Keywords: Receivables Management, Working Capital.

Introduction

Selling of goods and services under an agreement where the customer has to pay at a later date, the amount due from the customer is recorded as accounts receivables; therefore, receivables are assets accounts representing amounts owed to the firm as a result of the credit sale of goods and services in the ordinary course of business. The value of these claims is carried on to the assets side of the balance sheet under the title such as accounts receivable, trade receivables or customer receivables.

Managing trade credit is usually known as Management of Receivables. Receivable is one of the primary components of working capital, other than inventory and cash. And occupy important place after inventories and constitute a substantial portion of current assets. The investment in receivables is almost the same as that of the investment made in cash and inventories. Thus, Receivables form around one third part of total current assets in India.

Significance of Receivables Management

The essential purpose of company's receivable management is to determine effective credit policy that increases the efficiency of company's credit and collection division and contributes to the maximization of value of the firm. Some of the specific purposes of receivable management are as follows:

- To assess the creditworthiness of customers prior to granting or extending the credit.
- To reduce the cost of investment in receivables.
- To minimize the possible bad debt losses.
- To formulate the credit terms in such a way that results into maximization of sales revenue and still maintaining minimum investment in receivables.
- To minimize the cost of running credit and collection department.
- To maintain a trade off between costs and benefits associated to credit policy.

REVIEW OF LITERATURE

Khandelwal. N M (1985) studied the working capital management process and practices among 40 small scale industries in the state of Rajasthan, between 1975-76 and 1979-80. The study revealed that the management of receivables was highly ineffective and disorderly. It was found that bills of receivables constituted as much as 50% of total current assets. Highlighting the sickness in the Jodhpur industrial estate, the study attributed the main reason to the

Business Ethics & Corporate Governance: Role in Business Success

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Abstract

Today due to different unethical practices done by the various big organizations, the stakeholders and customers are regularly showing negative responses. So it has become the need for every organization to create transparency in its business practices which can only be possible through ethics and good governance. Corporate Governance (CG) is the set of processes, customs, policies, laws, and institutions affecting the way a corporation is directed, administered or controlled. CG also includes the relationships among the many stakeholders involved and the goals for which the corporation is governed. Corporate ethics play an important role in ensuring good CG and better corporate management. Corporate ethics and CG support corporate management. Ethical lapses and dilemmas are one of the root causes of many problems that corporate management is facing today. This paper aims to understand the concept of business ethics and CG as a necessity; to highlight essential governance principles, ethical codes and guidelines for an organization. This paper also tries to examine, with the help of few case studies and how CG can be profitable in the world market today.

Keywords: Ethics, Ethical codes, Corporate governance, Governance principles.

Introduction

One of the serious challenges facing mankind in organized social life is ethics - that is, the problem of choice between good and bad, do's and do not's etc. All the creations in this natural world follow certain fixed laws of nature. That is why we can exactly predict when the sun will rise tomorrow. But we cannot predict human behaviour in the same way. Nobody can confidently say that two individuals would behave in the same way tomorrow as they do today, because man has been endowed with the freedom to decide, which other creations do not possess. That is why philosophers and scholars have emphasized ethical development of human beings to ensure rational behaviour in society.

Since the last few years, we have witnessed a range of corporate scandals and failures from Enron, Arthur Anderson and WorldCom internationally to the recent Satyam Saga in India. More and more skeletons are tumbling out and the fact that this is happening in the bear market has further amplified the effect. Questions are being asked on audit and finance functions, board compositions and prevailing regulations. There is a war cry everywhere, "The system needs to improve".

Objectives of the Study

The objectives of the study are

- To understand the concept of business ethics and CG as a necessity;
- To highlight essential governance principles, ethical codes and guidelines for an organization.
- To examine, with the help of few case studies and how CG can be profitable in the world market today.

Literature Review

Good corporate governance practices help corporations and its stakeholders; to do so various audit committee mechanisms are required. Research on corporate governance with respect to the emerging market is much needed. Various benefits of better corporate governance practices are noticed. A corporate governance framework needs to be developed by providing a broad overview of recent corporate governance research. All aspects of corporate

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वैदिक वाङ्मय में पर्यावरण अध्ययन : एक दृष्टि

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विश्व को संस्कृति का ज्ञान देने का श्रेय वेदों को है। वेद ही विश्वबन्धुत्व, विश्व-कल्याण और विश्व-शान्ति के प्रथम उद्घोषक हैं। ये मानव कल्याणार्थ प्रकाश पुंज और शान्ति के अपार भंडार के समान हैं। वेदों के संदर्भ में मनु का यह कथन कि 'सर्वज्ञानमयी हि सः' अर्थात् वेदों में सभी विद्याओं के ज्ञान-सूत्र विद्यमान हैं। वैदिक साहित्यों में पर्यावरण अध्ययन से सम्बंधित विषय सामाग्री विशेष सूक्तों तथा मंत्रों में विखरे हुए रूप में प्राप्त होते हैं।

मानव-प्रकृत सम्बंध पर्यावरण अध्ययन का आधारभूत विषय वस्तु है। मानव की अनुक्रियाएँ, परिवेश से नियंत्रित होती हैं। मानव अपने ज्ञान विज्ञान और तकनीकी सुधार से सुविधाओं का सृजन करता है जो अतीत एवं वर्तमान दोनों ही कालखंडों में होता है। मानव की विविध संस्कृतियों मानव-प्रकृति सम्बंधों का प्रतीक है साथ ही पर्यावरण अवक्रमण (Degradation) बिगड़ते सम्बंधों का प्रतिफल है। वैदिक साहित्य ज्ञान का भंडार है जो पर्यावरण ही नहीं अपितु, विज्ञान के अन्य विद्याओं पर ज्ञान एवं चिन्तन रूपी प्रकाश से प्रकाशित करता है। इस लेख का मुख्य उद्देश्य वैदिक चिन्तन में पर्यावरण के विषय से अवगत कराना और संरक्षण के प्रति लोगों को जागरूक करना है। इसके लिए विभिन्न लेखकों के पुस्तकों एवं वेदों के सूक्तों तथा मंत्रों को उद्धृत किया गया है।

'भूमिर्माता, भ्रातान्तरिक्षम् धौर्नः पिता।'¹

'भूमिष्टवा पातु हरितेन विश्वभृद् अग्नि पिपर्तु- अयसा संजोषाः।'²

वेदों में पृथ्वी और उसके अन्य पर्यावरणीय पक्षों के महत्व की व्याख्या करते हुए उद्धृत है कि पृथ्वी को माता, द्युलोक को पिता, और अन्तरिक्ष को भ्राता के समान समझकर समआदर करें। इनको किसी भी रूप में क्षति होगा तो समस्त जीवमंडल, विशेष रूप से मानव संकटग्रस्त होगा। अतः इन तीन लोकों की सेवा करना (Eco-friendly) कष्टों से बचाना एवं यज्ञों द्वारा शोधित करना मानव समाज का परम कर्तव्य है। वहीं अन्य मंत्रों में द्यु-भू की उपयोगिता का उल्लेख करते हुए कहा गया है कि पृथ्वी(भूमि) हमें वनस्पतियों के रूप में हरियाली एवं सस्य सम्पदा प्रदान करती है। अग्नि अयस्क(लौह तत्व) प्रदान करता है तथा अन्तरिक्ष सूर्य प्रकाश एवं वर्षा का जल प्रदान करता है।

'त्रीणि छन्दांसि कवयो वि येतिरे पुरुरूपं दर्शतं विश्वचक्षणम्।

आपो वाता ओषधयः तान्येकस्मिन् भुवन आर्पितानी।।'³

उपरोक्त वैदिक मंत्र में पर्यावरण के संघटकों (Component) को स्पष्ट किया गया है। पर्यावरण के तीन संघटक : आपो(जल), वाता (वायु) एवं ओषधयः (औषधि युक्त) वनस्पति का उल्लेख, जो परिस्थितिकी के संघटक: अजैव (Abiotic) एवं जैव (Biotic) संघटकों के समरूप है। ये संघटक ही पृथ्वी पर जीवन के आधार हैं। इन तत्वों द्वारा हमारी पृथ्वी (भूमि) आवृत है। इन्हें 'छन्दस्' कहा गया है। पर्यावरण घटकों का अनेक नाम होने से ही, इन्हें 'पुरुरूपम्' अर्थात् अनेक रूपों वाला कहा गया है। जो संसार (विश्व) के समस्त जैवजगत की रक्षा करते हैं।⁴ अर्थात् उपरोक्त वैदिक मंत्र, वर्तमान पर्यावरणीय विषय-वस्तु के समरूप ही अध्ययन का बोध कराते हैं।

'सूर्य आत्मा जगतस्यस्थुषश्च।'⁵

'सविता प्रसवानाम् अधिपतिः।'⁶

'मर्तेषु-अग्निरमृतो नि धायि।'⁷

'आग्नेस्मृतो अभवद् वयोभिः।'⁸

'अग्ने..... त्मना शतिनं पुरुरूपम्।'⁹

'स्तीर्ण अस्य संहतो विश्वरूपा।'

उपरोक्त मंत्रों में पर्यावरण के प्रमुख संघटक, उर्जा(सूर्य) के महत्व एवं उपयोगिता का वर्णन किया गया है। सूर्य सम्पूर्ण जगत का आत्मा है। अर्थात् पर्यावरण के अजैव-जैव जगत का आधार है। सूर्य ही पृथ्वी पर ऊर्जा का प्रमुख स्रोत है जो पृथ्वी पर स्थित समस्त पादप एवं जन्तु संघटकों को उर्जा रूपी शक्ति से संचालित एवं पोषित करता है। इन वैदिक मंत्रों में परिस्थितिकी के ऊर्जा प्रवाह एवं रूपान्तरण (Energy flow & Transformation) का भी संकेत मिलता है। ऊर्जा अक्षय, अमर एवं वयस (Inexhaustible) Ubiquites & Potential Energy) है। ऋग्वेद में उल्लेख है कि ऊर्जा कभी नष्ट नहीं होता, बल्कि उनका

अम्बेडकर नगर जिले का जनसंख्या प्रतिरूप : एक भौगोलिक विश्लेषण

सन्तोष कुमार*
डॉ. चंद्र प्रकाश सिंह**

ABSTRACT

प्रस्तुत शोध- पत्र में अम्बेडकर नगर जिले की जनसंख्या एवं समस्त जनांकिकीय विशेषताएं जैसे - जनसंख्या वृद्धि दर, जनसंख्या घनत्व, महिला, पुरुष जनसंख्या, लिंगानुपात ग्रामीण- नगरीय जनसंख्या, साक्षरता एवं प्रति रूपों का अध्ययन करके अध्ययन क्षेत्र में होने वाली समस्याओं का समाधान एवं सुझाव प्रस्तुत कर शोध -पत्र को प्रभावी बनाने का प्रयास किया गया है। जनसंख्या प्रतिरूप को कई भागों में वर्गीकृत कर जनसंख्या वितरण को स्पष्ट तरीके से समझाने का प्रयास किया गया है।

KEYWORDS

प्रस्तावना - भारत एक विकासशील देश है। जिसकी अर्थव्यवस्था का मूल आधार कृषि है। कृषि एक प्राथमिक व्यवसाय है। कृषि कार्यों का संपादन ग्रामीण क्षेत्र की जनसंख्या का मूल आधार है। ग्रामीण जनसंख्या कृषि के द्वारा अपने जीवन के भरण-पोषण के साथ-साथ अन्य प्रकार की आवश्यकता की पूर्ति कृषि से ही करते हैं। ग्रामीण क्षेत्र के लोग कृषि के अतिरिक्त अन्य व्यवसाय में कम लगे होते हैं। जिसके कारण गांव में निवास करने वाला मानव वर्ग की आर्थिक प्रगति कम हो पाती है, और वे आर्थिक प्रगति के साथ-साथ सामाजिक, शैक्षिक आदि क्षेत्रों में पिछड़ जाते हैं।

अध्ययन क्षेत्र - अम्बेडकर नगर उत्तर प्रदेश का एक जनपद है। जिसका 29 सितंबर 1995 में अयोध्या फैजाबाद जनपद से अलग करके इसका निर्माण किया गया। इस जनपद का अक्षांशीय विस्तार 26° 8' 40" उत्तरी अक्षांश से 26° 37' 50" उत्तरी अक्षांश एवं 82° 15' 50" पूर्वी देशांतर से 83° 06' 50" पूर्वी देशांतर के मध्य स्थित है। अम्बेडकर नगर की जनसंख्या वर्ष 2011 की जनगणना के अनुसार 2397888 एवं साक्षरता 72.23% है। अंबेडकरनगर जनपद का भौगोलिक क्षेत्रफल 2350 वर्ग किलोमीटर है। जिसमें ग्रामीण क्षेत्रफल 2257.53 वर्ग किमी० तथा नगरी क्षेत्रफल 92.47 वर्ग किमी० है। ग्रामीण क्षेत्र में कुल जनसंख्या 2117158 (88.26%) और नगरीय क्षेत्र में कुल जनसंख्या 280730 (11.74%) है।

अध्ययन का उद्देश्य - प्रस्तुत अध्ययन क्षेत्र का मुख्य उद्देश्य मानव के क्रियाकलापों, तकनीकी वातावरण एवं ज्ञान के फलस्वरूप उत्पन्न समस्याओं का समाधान एवं निर्धारण में सहायक हो। वर्तमान अध्ययन का उद्देश्य अंबेडकर नगर जनपद का जनसंख्या प्रतिरूप एक भौगोलिक विश्लेषण का अध्ययन है। जिसके मुख्य उद्देश्य निम्नलिखित हैं-

1. अध्ययन क्षेत्र में तीव्र जनसंख्या वृद्धि से आर्थिक विकास के संदर्भ में एक समस्यात्मक ज्ञान प्राप्त करना।
2. अध्ययन क्षेत्र में जनसंख्या वृद्धि के कारणों को जानना।

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The constraints in communication (information-input-processing and output) behaviour among the benifesior in district Allahabad

Mayank Singh and Ravi Pratap Singh

Abstract

Communication is the core activity of human association in general and progress as well as development in particular. No human life can exist in isolation. A man can survive only in society and the survival in society is possible with communication. Therefore, communication is identified as the oldest continued activity of human being since birth and goes-on and on till death. More precisely, communication is the basic need of human being and web of society which makes the survival, growth, progress and development of man possible and holds the society intact and progressive. The study was conducted in purposively selected Allahabad district of Uttar Pradesh. Out of 20 CD Blocks only 5 CD blocks-Bahadurpur, Chaka, Handia, Meja and Soraon were selected randomly. Thereafter 2 villages from each selected CD block were selected by using stratified random sampling method. These selected villages were Andawa and Bhagipur of Bahadurpur, Dabhawn and Chaka of Chaka, Jagwawala and Aasepur of Handia, Jamwa and Detwa Kala of Meja and Juwnapur and Chaturipur of Soraon CD Block. Further, stratified random sampling was used for the selection of respondents of three categories of farmers. These three categories of respondents were large, medium and small farmers according to their possession of land. Total of 155 respondents of small 106 respondents of medium and 39 respondents of large land holders were selected in ratio proportion from selected villages.

Keywords: communication, behaviour, benifesior, Allahabad

Introduction

India is predominately agricultural country. Majority of population, about 60 percent, of the country subsist on agriculture and its allied occupations and contributing 25 percent to our national income. The early years of independence the country had witnessed wide spread food shortages compelling to import large quantity of food grains even under PL-84. The widespread famine, flood, starvations, sufferings and deaths India was branded as "basket case" or "ship to mouth" or "field-to mouth" or "begging bowl". After independence Indian policies, administration reformers, agricultural scientist made considerable and significant efforts to break the begging bowl to the present food surplus. The extensive efforts in this direction was witnessed through the Green Revolution which launched in mid-sixties when the production was only 74.2 million tonnes. India trebled the production of food grains upto 211.2 million tonnes by 2001-2002. It is worth to quote today India is the second highest producer of wheat in the world touching 76.4 million tonnes in 2000 A.D. Resultantly, India is able to raise its status among the comity of nations as one of the premier agricultural countries of the world. Due to large buffer stocks of food grains India is able to help generously countries which needed food, whether it is the war, drought, terrorism hazards and like. Today, India is the third biggest producer of food grains in the world. Scientists, and the planners, politicians, and responsables of country have already realized to meet the future challenges of growing population of India by 2020 and even 2030 onwards. The futurology has been worked out and started implementing massive development programmes to modernize the agriculture through research and technology. It is clear that the main problem is not the lack of technology but its integration of farming practices in order to convert the information into production accomplishment. Vashistha (1987) stated that there are hundreds of extension programmes to reach millions of farmers in lakhs of villages. To fulfil the mission of any extension programme there is need to study the communication behaviour of the target audience. The communication behaviour refers the activity performed by an individual from the collection of

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Response of nitrogen levels on yield and growth attributes of potato (*Solanum tuberosum* L.)

Sriom, Mayank Singh and Avanish Kumar Singh

Abstract

The present investigation was carried out at Main Experiment Station, Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad (U.P.), during the year 2014-15 and 2015-16. The seven treatments were evaluated on cv. Kufri Khayti in Randomized Block Design with three replications. The study revealed that almost yield attributes are influenced by increasing different levels of nitrogen and found significantly higher by the increasing of the levels of nitrogen. The yield attributes viz., Number of tubers per plot (grade wise), Weight of A, B, C and D grade of tubers per plot (kg), Total number of tuber per plot, Total yield of tubers per plot (kg) and tuber yield per hectare recorded maximum with the application of treatment (T₅) 200 kg N/ha during both the years (2014-15 and 2015-16). The study further revealed that the treatment T₅ also had maximum net return and cost benefit ratio during both the years of investigation.

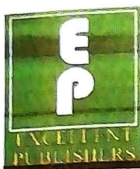
Keywords: potato, tuber yield, number of tubers grade wise and economics

Introduction

Potato (*Solanum tuberosum* L.) is whole some food and belongs to the family Solanaceae. It has originated in South America and now commercially grown in all over the world. Nutrients supply is one of the major part for enhancing tuber yield as well as proper growth and development of the plant. Among different plant nutrients nitrogen is the most important element for promoting growth, yield and quality of tubers in potato. Nitrogen is an essential constituent of protein and chlorophyll and is found in many other compounds of paramount physiological importance in plant metabolism such as nucleotides, phosphitides, alkaloids enzymes, hormones, vitamins etc. Thus, nitrogen is the basic constituent of plant life. In plant nitrogen imparts dark green colour and promotes leaf, stem and other vegetative growth, it increases to a considerable extent in the utilization of potassium, phosphorus and other micro elements. As for the nitrogen deficiency is concerned it depresses both the rate and extent of protein synthesis. During early stage of plant, nitrogen deficiency is responsible for accumulation of carbohydrate. At later stage, flowering and fruit setting are adversely affected due to nitrogen deficiency.

Materials and methods

The experiment was conducted during the winter season of 2014-15 and 2015-2016 at Main Experiment Station Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.), Geographically, the experimental site falls under humid, sub-tropical climate and is located at 26.47° N latitude and 82.12° E longitudes on an elevation of about 113 meter above mean sea level in the Indo-Gangetic alluvial soil belt of eastern Uttar Pradesh. Faizabad region receives a mean annual precipitation of about 1200 mm. Maximum rainfall in this area is received from mid-June to end of September. However, occasional showers are very common in the month of January and February. The winter months are cold whereas, summer month are extremely hot, the western hot winds locally known as *Loo* starts from April and continued till the onset of monsoon in month of June. The experiment was conducted in Randomized Block Design (RBD) with four replications. The seven treatments were allocated randomly in to the plots in such a way that each and every treatment was received only once to each block. And every treatment was received only once to each block.



Original Research Article

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Study on the Socio-Personal and Economic Characteristics of Respondents among the Beneficiary in District Allahabad, India

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ABSTRACT

Communication is the major activity of human association in general and progress as well as development in particular. No human life can exist in isolation. A man can survive only in society and the survival in society is possible with communication. Therefore, communication is identified as the oldest continued activity of human being since birth and goes-on and on till death. More precisely, communication is the basic need of human being and web of society which makes the survival, growth, progress and development of man possible and holds the society intact and progressive. The study was conducted in purposively selected Allahabad district of Uttar Pradesh. Out of 20 CD Blocks only 5 CD blocks – Bahadurpur, Chaka, Handia, Meja and Soraon were selected randomly. Thereafter 2 villages from each selected CD block were selected by using stratified random sampling method. These selected villages were Andawa and Bhagipur of Bahadurpur, Dabhawn and Chaka of Chaka, Jagwawala and Aasepur of Handia, Jamwa and Detwa Kala of Meja and Juwnapur and Chaturipur of Soraon CD Block. Further, stratified random sampling was used for the selection of respondents of three categories of farmers. These three categories of respondents were large, medium and small farmers according to their possession of land. Total of 155 respondents of small 106 respondents of medium and 39 respondents of large land holders were selected in ratio proportion from selected villages.

Keywords

Socio-personal communication

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Introduction

India is predominately agricultural country. Majority of population, about 60 per cent, of the country subsist on agriculture and its allied occupations and contributing 25 per cent to our national income. The early years

of independence the country had witnessed wide spread food shortages compelling to import large quantity of food grains even under PL-84. The widespread famine, flood, starvations, sufferings and deaths India was branded as “basket case” or “ship to mouth” or “field-to mouth” or “begging bowl”. After

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Studies on heritability in narrow sense and genetic advance in Tomato (*Solanum lycopersicum* L.) crops

Gaurav Singh, PK Singh, GC Yadav, Angad Singh, VP Pandey and Mayank Singh

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Abstract

The present investigation entitled "Studies on heritability in narrow sense and genetic advance in Tomato (*Solanum lycopersicum* L.) crop." was conducted during *Rabi* seasons of 2017-18 (E₁) and 2018-19 (E₂) heritability and genetic advance using diallel mating design at the Main Experiment Station (MES) of the Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Narendra Nagar, Kumarganj, Ayodhya (U.P.) India. Ten diverse parents of tomato were crossed in a diallel fashion (excluding reciprocals) for generating experimental material. All the Ten parents and their 45 hybrids were grown in Randomized Block design with three replications. Observations were recorded on the 16 characters viz., Days to 50 per cent flowering, Days to first fruit harvest, Plant height (cm), Number of primary branches per plant, Number of fruits per cluster, Number of fruits per plant, Average fruit weight (g), Pericarp thickness (mm), Number of locules per fruit, Fruit length (cm), Fruit diameter (cm), Marketable fruit yield per plant (kg), Total fruit yield per plant (kg), Total soluble solids (%), Titrable acidity (%), Ascorbic acid content (mg/100 g fresh fruit).

High heritability (narrow sense) along with high genetic advance in per cent of mean were observed for most of the important economic traits showing ample scope of improvement.

Keywords: Tomato, heritability, genetic advance, yield

Introduction

Tomato (*Solanum lycopersicum* L.) is one of the most popular solanaceous vegetable crop, having chromosome number $2n=2x=24$. Tomato universally treated as "Protective Food" is being extensively grown as annual plant all over the world. Tomato ranks second in importance next to potato in many countries including India (Bose and Som 1993)^[3]. It is a highly worked crop by the horticulturists and breeders. Tomato is used as fresh as well as processed vegetable. It is also very important for processing industries as it ranks first as processing vegetable crop in the world. It is a very good source of income for small and marginal farmers. Ripe fruits are widely used for preparation of several items like paste, syrup, juice, ketchup, puree and drinks etc.

Fresh fruits of tomato are in great demand round the year throughout the country. Tomato is a rich source of vitamins, minerals and organic acid. There are various types of flavoring compounds found in the fruits, which enrich the taste. The hundred gram mature tomato fruits contains 94 g moisture, 3.6 g carbohydrates, 0.9 g protein, 0.2 g fat, 585 IU vitamin A, 48 mg calcium, 26 mg vitamin C & Vitamin B (Thiamine 0.12 mg and Riboflavin 0.06 mg) (Choudhary *et al.*, 2009)^[4].

Tomato is an herbaceous sprawling plant growing up to 1-3 m in height with weak woody stem. The flowers are yellow in colour and the fruits of cultivated varieties vary in size from cherry tomatoes, about 1-2 cm in size to tomatoes, about 10 cm or more in diameter. Most cultivars produce red fruits when ripe. The plants have taproot system and two types of growth habit, determinate & indeterminate. Fruits bearing of different types. Determinate or bush types bear a full crop at once and top off at a specific height. They are often good choices for container growing and determinate types are preferred by commercial growers who wish to harvest a whole field at one time, or home growers which are interested in canning.

A Recent Trend of Microfinance Industry in India

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Abstract

Microfinance basically means granting short term credits to investors for a short duration to low income group individuals for their livings. Basically microfinance is granted to individuals or group of individuals for ensuring entrepreneurial activities on a small scale. Microfinance industry shows a growth of 40% of increase in loan portfolio as on March 2019 compared to 2018. Even the loan disbursement showed a hike of 20% in terms of Volume. Cost of recovering and delinquency level showed an overall improvement in Microfinance Pulse report published by SIDBI.

Keywords: Microfinance, delinquency, Entrepreneurial.

Introduction

Micro financial Institutions plays a catalytic role in economic development of an economy, generating employment and creating overall development of the nation. Although the Government of India is playing dominant role in channelizing money through priority sector lendings, Micro Units development and refinance agency. A report presented by SIDBI represents the future Visions of microfinance in India exploration of new investment channels through reduced overall cost, revision of regulations for risk management and credit control through revised guidelines, women empowerment through assisting in employment activities. When it comes to overview banks seems to be more stable in terms of recovery cost, size of loans and access to funds. According to Pulse report published by microcredit June 2019, the basic objective of microcredit is to be from jobseeker to job provider by reaching the doorstep of every unbanked customer.

Number of Disbursement of Loans by Different Institutions (Lakhs)

Institutions	2016	FY 2017	FY2018	FY2019
Banks	125	129	141	187
SFB	120	99	88	103
NBFC-MFIs	213	219	277	322
NBFCs	37	31	49	55
Not for Profit MFIs	21	7	7	7
Total	516	485	562	674

Source- Microfinance Pulse report, Equifax, SIDBI, June 2019.

The graph depicts that banks have witnessed highest growth rate in financial year 2018 to financial year 2019 at the rate of 32%. The result depicts that NBFCs MFI disbursed the highest number of loans among all categories of lenders. Banks have witnessed the highest number of loan disbursement in the financial year 2019 when compared to 2016- 2018 i.e., 125, 129, 141 respectively. Even the report suggests loan disbursement grew by 20% in terms of volume. Banks are the second largest provider of microcredit. The target of disbursement of loan is empowering women through skill development and credit assessment mechanism. India aiming to achieve 5 trillion economy by 2025 can be achieved by only when microfinance industry plays an active role that can contribute to country's overall economic growth and development.

With the presence of multiple players of moneylenders in the market it is essential for the lenders to have collaborative approach taking into consideration the risk bearing approach of the money lenders.

Employability through Skill Development Mission in India

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Abstract

Only having educational qualification for getting job is not enough, there should be something specific quality within you which make you unique means you should have skill for particular job. That is why government of India has taken initiative to enrich you with skill for employment purpose. Skill India Mission is a special mission for youth of India specially those youth who have less educational qualification, like drop out students from school and college. This paper is an attempt to throw light on the schemes which are launched under the skill development mission and how these schemes are helping in generating the employment of Indian youth. Present study also covers the role of skilled women at workforce. Data used for present study are completely secondary.

Keywords: Educational, job, skill, mission, schemes, employment.

Introduction:

India is second largest country in terms of population after China and having large part of it unemployed. As per the report of Center for Monitoring Indian Economy (CMIE), the urban unemployment rate was at 9.6 per cent, and rural stood at 7.8 per cent during the Month of August, 2019 and overall rate of unemployment hit a 3 Year high of 8.4 % in the same month. Although Indian government had taken various steps to reduce the unemployment of the country from time to time yet some steps has to do. Skill development mission is one of them steps of the government to curb the unemployment of the country. Skill development mission is an initiative of current BJP led government which was launched by the Hon'ble Prime Minister of our country Shri Narendra Damodar Das Modi on 15 July, 2015 through Skill India campaign for the purpose of training more than 40 crore people in India in different skills by 2022. There are various Schemes of Skill Development programs such as Pradhan Mantri Kaushal Vikas Yojana (PMKVY), Apprenticeship Training Scheme (ATS), Craftsman Training Scheme, Deen Dayal Upadhyaya Kaushalya Yojana, SANKALP, UDAN, etc. launched by different ministry of Government of India, one of the important ministries of government which play crucial role for taking initiative in launching and implementing the skill development programs is Ministry of Skill Development and Entrepreneurship.

Objectives:

1. To highlight the various schemes which provide employment through Skill Development Mission.
2. To know the growth of Skill Development mission and its impact.
3. To know the participation of female in work force.

Methodology:

The present study is exploratory and analytical in nature and secondary data are used for the purpose of the study. The sources of secondary data used are magazines, news, reports by different organization, research papers, articles etc.. Suitable tables and diagram have also been used for the present study to make the paper more attractive, clear, precise and understandable.

Schemes of Skill Development Mission:

The Union Cabinet on 1 July, 2015 has given his consent to The National Skill Development Mission and Hon'ble Prime Minister of India, Narendra Modi on 15 July, 2015 officially launched the Mission on the day of World Youth Skills Day. The Mission has been

A Study of Retail Marketing in the Indian Context: Emerging Dimensions and Approaches

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Abstract

The Indian retail industry has emerged as one of the most dynamic and fast-changing industries around the globe due to the entry of several new players. It accounts for over 10 per cent of the country's Gross Domestic Product (GDP) and around 8 per cent of the employment. India is the world's fifth-largest global destination in the retail space, comprising of organized and unorganized sectors. The Retail industry reached to Rs. 66.39 lakh crore (US\$ 950 billion) in 2018 at CAGR of 13 per cent and expected to reach Rs. 76.87 lakh crore (US\$ 1.1 trillion) by 2020. According to the 10th Annual Global Retail Development Index (GRDI) of A.T. Kearney, India is having a very strong growth fundamental base that's why it's the perfect time to enter into Indian Retail Market. Foreign giants like Wal-Mart and IKEA have recently received the Government's nod to enter into the Indian market, after making all the necessary compliances. This research paper provides the current status of the retail sector in India and the detailed information about the challenges faced by the retail sector in India. The paper includes the opportunities of retail stores, retail format in India and the recent trends in retail. This paper surveys the managers to understand the challenges impacting the retail sector. It concludes with providing the detailed opportunities available for the retail sector in the Indian market.

Keywords: Retail Industry, Challenges, Opportunities, Retail formats, Emerging Trends.

Introduction

Indian retail has been a traditionally unorganized sector, dominated by counter-stores and street vendors. In the name of retailing, the unorganized retailing has dominated the Indian landscape so far. According to an estimate the unorganized retail sector has 97% presence whereas the organized accounts for merely 3%. Organized retail is reflected in sprawling shopping center, multiplex, malls and huge complex which offer shopping, entertainment and food all under one roof. However, the retail industry in India is undergoing a major shake-up as the country is witnessing a retail revolution. The old traditional formats are slowly changing into more complex and bigger formats. Malls and mega malls are coming up in almost all the places be it – metros or the smaller cities, across the length and breadth of the country. Govt. of India's plan of changing the FDI guidelines in this sector speaks of the importance attached to retailing. Recently moves by big corporate houses like Reliance Industries has further fuelled the major investments in retail sector. A strategic alliance, land acquisitions in prime areas give the essence of the mood in this sector.

Objectives:

1. To study the current status of the retail sector in India.
2. To study the retail formats.
3. To study the challenges impacting the retail sector.
4. To study the opportunities available and future of the retail sector.

NPAs in Scheduled Commercial Banks: A Trend Analysis

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Abstract

The banking sector is the most important sector of the Indian economy. Banks play a significant role in the development of Indian economy. The banking sector is facing severe problems of increasing Non-Performing Assets. NPAs is one of the main anxieties for scheduled commercial banks in India. A high degree of NPAs means a high possibility of a huge number of credit defaults which affect the profitability and net-worth of scheduled commercial banks. The problem of rising NPAs is not only affecting the scheduled commercial banks but also the whole Indian economy. It is essential to prevent rising of NPAs for better economic and future of the country. A study is made in this paper to understand NPAs, the trends and status of NPAs in banks and also examines the impact of NPAs on Indian economy.

Keywords- Non Performing Assets, Banking Sector, Indian Economy.

Introduction

In every country, the banking sector is like the life blood of the economy. Any problem relating to the banking sector will negatively affect the economy of the country. Banking sector of India has been facing so many severe problems regarding the increasing level of NPAs. A parameter issued for bank about NPAs by the RBI that if the interest and principal amount overdue beyond 90 days i.e. the cash credit, term loan, overdraft and bill purchase or discount are all categorised as NPAs. NPAs directly affects the liquidity, profitability, the value of assets and the performance of the banks. The level of increasing in default of lending is leading to increase in Non-Performing Assets, reduce the profit and assets quality in the financial statements of banking sector. The problems of NPAs is not just affecting the banks but also the whole economy of the country. The size of NPAs in banking sector is relatively high in public sectors banks. To sustain the profitability and efficiency of banking sector the NPAs need to be controlled and reduced. The degree of NPAs is the best indicator for determining the health of banking segment of a country.

Handling bad loans and reducing them at the lowest level is the keyword for maintaining the NPAs in the banking sector. Performance of banks is measured by NPAs and its failure negatively affects their financial health and a reason of economic crisis in the long period. Increasing the level of NPAs shows the big number of credit defaults that affect the profit and net-worth of banks and also reducing the value of financial asset. For the flourishing economy, banking sector must be strong and healthy. In India and also worldwide banks had registered speedy credit growth which is partially reason for NPAs. Besides, a high rate of interest has also caused an increase in bad debts. The worldwide most dangerous problem for scheduled commercial banks in current times is strengthening NPAs which are affecting their viability and solvency and thus finally challenging to their survival in banking sector.

Objectives of the Study

1. To study the status of Non-Performing Assets of Indian Commercial Banks in India.
2. To study the trends of Gross and Net Non-Performing Assets in Scheduled Commercial Banks in India.
3. To know the impact of Non-Performing Assets on Indian Economy.

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Antibacterial Compounds from Non-Heterocystous Cyanobacteria: A Review

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ABSTRACT

Diterpenoids (Abietane), Cyclic peptide (Brunsvicamides A, Brunsvicamides B, Brunsvicamides C), Fatty acid (Coriolic acid & α -dimorphecolic acid), Polyphenyl ether (Crossbyanol A, Crossbyanol B, Crossbyanol C, Crossbyanol D), Cyclic undecapeptide (Kawaguchipectin A and Kawaguchipectin B, Lyngbyazothrin A, Lyngbyazothrin B, Lyngbyazothrin C, Lyngbyazothrin D), Polyketide hybrid (Malyngolide), Diterpenoid (Norbietaene), Cyclic peptide (Pahayokolide A and Pahayokolide B), Cyclic depsipeptide (Pitipeptolide A, Pitipeptolide B), Lipopeptide (Schizotrin A) and Terpenoid (20-nor-3 α -acetoxy-12-hydroxy-abieta-5,7,9,11,13-pentaene) are diverse group of antibacterial compounds isolated and characterized from non-heterocystous cyanobacteria. Genus *Lyngbya* is extensively explored for antibacterial compounds among non-heterocystous cyanobacteria. Most of the non-heterocystous cyanobacterial genera are not searched for antibacterial compounds. Hence, there is a wide scope for mining of antibacterial compounds from Non-heterocystous cyanobacteria.

KEYWORDS: Cyanobacteria, Non-heterocystous, *Lyngbya*

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EFFECTS OF FUNGICIDE CM-75 ON GROWTH, BIOCHEMICAL COMPOUNDS AND SOME ENZYMES OF *FISCHERELLA MUSCICOLA* NDUPC001

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Abstract

Fischerella muscicola NDUPC001 was isolated from agricultural fields of Varanasi, India and characterized by morphological as well molecular means. The organism was deposited at NAIMCC (NBAIM), Mau, India (Accession No. NAIMCC-C-00121). Fungicide CM-75 inhibited growth, biochemical composition and some enzymes of *Fischerella muscicola* NDUPC001. LC₅₀ conc. of fungicide was 6ppm and 3ppm, 6ppm, and 9ppm were concentrations of treatments. All concentrations of CM-75 inhibited the growth of cyanobacteria, and maximum inhibition was observed in 9ppm treatment. Treatment concentrations of fungicide decreased the Chl.-a and carbohydrate content of cyanobacteria with maximum inhibition of 29.29% and 29.9% respectively in 9ppm treatment. Total protein content was slightly increased (2.52%) in 3ppm treatment and decreased in other treatments with maximum inhibition of 19.26% in 9ppm treatment. Fungicide inhibited the activity of Nitrate reductase and Glutamine synthetase with maximum inhibition of 35.11% and 21.74% respectively in 9ppm. The findings of the experiment suggest that high tolerance level of *Fischerella muscicola* NDUPC001 against fungicide CM-75.

Key words: Cyanobacteria, *Fischerella muscicola* NDUPC001 and CM-75

Introduction

Cyanobacteria are capable of colonizing nearly all habitats on our planet (Whitton & Potts, 2000) and are widely distributed from aquatic to the terrestrial environment. It has been established that cyanobacteria play a significant role in soil genesis and conservation. Cyanobacteria produce humus on the soil surface after their death and decay, and it dissolves certain soil minerals for maintaining a reservoir of the element in a semi available form for higher plants. The pertinent genera in soils include *Anabaena*, *Cylindrocapsa*, *Lyngbya*, *Microcoleus*, *Nodularia*, *Nostoc*, *Fischerella*, *Oscillatoria*, *Phormidium*, *Plectonema*, *Scytonema*, *Synendra*, and *Tolypothrix*, etc. Role of cyanobacteria in fertility of rice fields are well established. Paddy fields favor the luxuriant growth of cyanobacteria, and most of the biological nitrogen fixation of this ecosystem is done by N₂-fixing cyanobacteria (Irisarri *et al.*, 2001). Many nitrogen-fixing strains of cyanobacteria have been isolated

and used in biofertilizer consortia in Southeast Asian countries. Pesticides are regularly used in agricultural fields to decrease the loss due to pests. A score of fungi causes disease on plants throughout the world. Damage due to fungal diseases are one of the major problems of agriculture. Crop area of paddy is about 24% with pesticide use of 17.2% (Mamthanayagam and Sharinila, 2004). Use of fungicides increased from 10% (1996) to 21% (2000) amounting 10910 tons (Agnihotri, 2000). Fungicides besides controlling target fungi also have shown an adverse impact on beneficial microbes of soil including cyanobacteria. Fungicide zineb inhibited the growth of *Cylindrocapsa* sp. and *Nostoc muscorum* at 1ppm and 5ppm respectively (Venkataraman and Rajyalakshmi, 1971). Soil fungicides nabam and vapan also showed varying degree of toxicity towards rice field cyanobacteria (Venkataraman and Rajyalakshmi, 1972). Captan decreased the growth of *Westiellopsis prolifica*, *Aulosira fertilissima*, *Nostoc* sp., *Tolypothrix tenuis*, and *Calothrix* sp. (Gangawane and Saler, 1979a). The growth of *Westiellopsis* sp., *Aulosira* sp., *Calothrix* sp., *Nostoc*

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