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3.4.3 Proof of Paper Publications in Journals

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Short Communication

Development of New Mulluscicide against *Lymnaea acuminita*: Synthesis and Biocidal Activity of Novel Fused Indino [1,2-d]-[1,3] Thiazin-5(4H)-one Derivatives

Akhilesh Singh[1], Abhishek Singh*[2] and Ashutosh Singh[3]

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Key words: Thiazine, Indino, LC_{50}, Molluscicidal activity, *Lymnaea acuminate*

Nowadays no bioactive agent plays a vital role to increase a product of agricultural crop, industrial production prolonging the utility of manufacture product controlling human and animal disease. Unfortunately, the number of effective and commercial bioactive agent is very limited. No biocidal agent developed till to date is so versatile to provide remedy against several microorganisms. Some have phytotoxic and several have residual toxicity. Therefore, suitable remedy is still essential to solve these problems. Thus, the basis of selecting heterocycles as the subject of this investigation was realization of the fact that heterocyclic compounds are in clinical use since a long time derived from natural source such as vitamins, hormones, and antibiotics [1-2]. Therefore, we have much attention to design the biologically active molecules [3-12]. Among the heterocyclic systems we have selecting the one class of heterocyclic compounds is 1,3 thiazine. The 1,3 thiazine are shows wide range of biocidal activity such as antibacterial [13], antifungal [14], antioxidant [15], herbicidal [16], antipyretic [17], calcium channel modulator [18-20], insecticidal [21] and antitumor [22]. Literature also reveals that compound containing thiazine fused system are shows more biocidal properties. Keeping above observation in mind and in continuation of our work on biologically active heterocycles and their increasing importance in pharmaceutical and biological field, it was planned to synthesize novel fused systems incorporating the two-active pharmacophore in a single molecular frame work and to evaluate their pharmacological activities. Here in we report the synthesis of numbers of fused indinothiazine derivatives together with their use in a series of heterocyclic transformations and evaluation as biocidal agents.

* Abhishek Singh
abhupc@gmail.com

[1] Department of Chemistry, K. S. Saket P.G., College, Ayodhya - 224 001, Uttar Pradesh, India

[2,3] Department of Chemistry, U. P. College, Varanasi - 221 002, Uttar Pradesh, India

Apparatus and chemicals

All reagents were purchased from Aldrich, solvents used were extra dried. Procedure for one typical case for each step has been described. All melting points were determined in open glass capillaries and are uncorrected. IR spectra were recorded in KBr on a Perkin-Elmer-157 spectrophotometer (cm^{-1}), ^1H NMR and $^{13}CNMR$ spectra in DMSO-d_6 on a Varian EM-360 (200 MHz) spectrometer using TMS as internal reference (chemical shift in δ ppm). Elemental (C, H, N) analysis indicated that calculated and observed values were within acceptable limit. The purity of compounds checked by thin layer chromatography on silica gel plate using ether and ethyl acetate as solvent system. Iodine chamber was used as developing chamber.

General procedure for the preparation of 4-(Substitutedphenyl)-2-arylidenindan -1, 3-diones (I)

A mixture indan -1, 3 -dione (0.01 M) substituted benzaldehyde (0.01 M) and fused sodium acetate (0.16 gm 0.02 M) were refluxed in glacial acetic acid in presence of methanol for four hours. The reaction mixture was cooled and poured in to water. The resulting solid mass was filtered, washed with water and recrystallised from aq. ethanol. All these prepared compounds are known and reported by us earlier [23-25].

General procedure for the preparation of 4-(4-Substituted phenyl) 2 imino-1,2-dyhydro indeno-[1,2-d] [1,3] -thiazin-5-(4H)-ones (II)

The cyclocondensation of 4- (Substitutedphenyl) -2-arylidenindane **(I)** (0.01M) with thiourea (0.01M) and KOH (0.62 gm, 0.011M) was refluxed in methanol for 4 hours furnished the 4-(4-Substituted phenyl) 2- imino-1,2-dyhydro indeno-[1,2-d] [1,3] -thiazin-5-(4H)-ones **(II).** The reaction mixture was cooled and poured into water. The resulting solid mass was filtered, washed with water and recrystallized from aq. ethanol gave the titled fused heterocycles **(II). (Scheme-I)**.

Other compounds of the type (IIa-IIg) were prepared similarly.

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D Non Empty Charged Perfect Fluid in General Relativity

Tushar Kant Srivastava, Department of Physics,
Udai Pratap (Autonomous) College, Varanasi, Uttar Pradesh, INDIA
Jyotsna Srivastava, Department of Physics,
R.S.K.D. P.G. College, Jaunpur, Uttar Pradesh, INDIA

ORIGINAL ARTICLE

Corresponding Authors

Tushar Kant Srivastava, Department of Physics,
Udai Pratap (Autonomous) College, Varanasi,
Uttar Pradesh, INDIA
Jyotsna Srivastava, Department of Physics,
R.S.K.D. P.G. College, Jaunpur,
Uttar Pradesh, INDIA

shodhsamagam1@gmail.com

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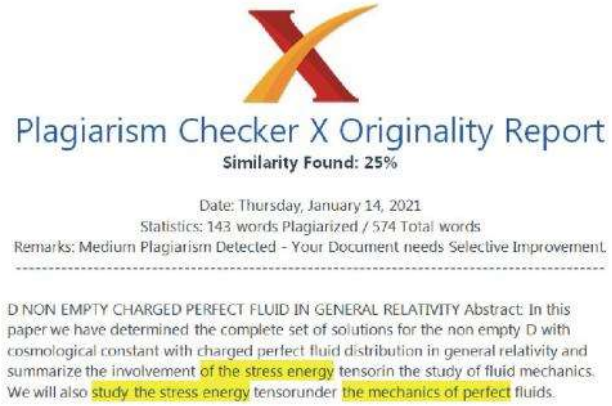


Abstract

In this paper we have determined the complete set of solutions for the non empty D with cosmological constant with charged perfect fluid distribution in general relativity and summarize the involvement of the stress energy tensorin the study of fluid mechanics. We will also study the stress energy tensorunder the mechanics of perfect fluids.

Key Words

Perfect fluid, Cosmological constant, Metric Tensor.

Introduction

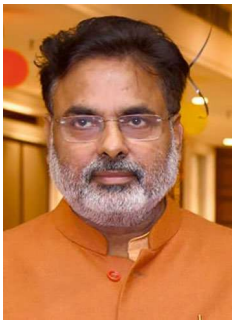
This paper deals about rotating matter in general relativity. Authors have solved Einstein-Maxwell equation by giving the form of the metric given by Dubey (1995). The metric has four arbitrary functions P, P_1, Q, Q_1. In this the first two function depend on x and other two on y. Starting from single canonical metric element, authors have presented by integrating field equations all the null or non-null arbitrary D solutions. The coordinates (x, σ, y, τ) are arbitrary and have freedom of being interpreted time like or space-like. For $H(x, y) = 1$, we recover the metric discover by Mishra (1983). The metric for $P_1 = Q_1 = 1$ goes over to the metric founded by Diaz (1983)

The Equation of metric is

$$ds^2 = H^{-2}[-\frac{\Delta}{PP_1}dx^2 - \frac{P}{\Delta}(d\tau + pd\sigma)^2 - \frac{\Delta}{QQ_1}dy^2 + \frac{Q}{\Delta}(d\tau + md\sigma)] \quad \ldots\ldots (1.1)$$

Where

$$P = P(x), \quad Q = Q(y), \quad \Delta = m - P, \quad p = p(y) \quad \ldots\ldots (1.2)$$
$$P_1 = P_1(x), \quad Q_1 = Q_1(y), \quad m = m - x, \quad H = H(x, y)$$



Credit: Vipin Bahadur Singh

The human costs of COVID-19 policy failures in India

The current surge of COVID-19 cases and deaths are a result of ineffective policy responses, an anti-scientific attitude, and a fragile underfunded health care system, argues Vipin Bahadur Singh.

A deadly second wave of coronavirus infections is devastating the lives of people across India, leaving millions of people infected and putting stress on the country's already overtaxed health care system. Indians gasping for breath are being turned away, transferred, or set on waiting lists at overfull hospitals, because of the unavailability of beds and oxygen. The international community is astounded to see the scenes of mass death in the world's largest democracy.

This devastation would have been inconceivable a couple of months ago. Children were back in school, people were busy at their workplaces, and large crowds were enjoying themselves at festivals. At the beginning of March 2021, 7-day averages in India were around 15,000 cases per day. By late April, the rate had reached almost 350,000. New daily cases exceeded 400,000 on 1 May and were reported to be 414,188 on 6 May 2021, the highest single-day number of new coronavirus infections recorded globally, with reported deaths exceeding 4,000 in a single day.

The massive second wave of COVID-19 sweeping through India is partly fuelled by the fast transmission of newly emerging variants, B.1.1.7 and B.1.617. Airborne transmission and infections without symptoms pose considerable challenges, and until recently, asymptomatic and presymptomatic transmission were not widely recognized in India as drivers of the spread of COVID-19. Reducing airborne transmission requires measures to avoid inhalation of infectious aerosols, such as ventilation, air filtration, reducing crowd gatherings, and wearing high-grade masks indoors. The situation requires higher-grade protection for healthcare and front-line COVID-19 warriors and the effective management of the health care systems for immediate actions to prevent the spreading of the virus.

But these measures were not strictly adopted at the early stage of the second wave in March 2021, due to political indecisiveness and lack of regard for scientific findings, despite the fact that a group of scientific advisers set up by the central government warned in the first half of March 2021 about a new and more contagious variant of the coronavirus. There is a common thread connecting the responses in India, Brazil, and last year's United States: not listening to their scientists. As the foremost leaders of the central government have been engaged in planning and managing elections in many provinces, they have ignored or delayed acting on scientific advice. Our crowd-pleasing leaders have allowed—and in some cases, even encouraged—mass gatherings. The government was probably satisfied with India's main computer simulation prediction results, which showed that the disease spread in the country was in the 'endgame' of the epidemic. Millions of largely unmasked people attended religious gatherings and election rallies. So, the carelessness of those holding political power has also partly fueled the country's coronavirus crisis.

According to World Bank data (2018), India's total health care spending is a mere 3.5% of gross domestic product (GDP), far lower than countries like the USA (16.9%), France (11.3%), and the UK (10%), and also lower than in countries like Brazil (9.5%) and South Africa (8.3%). India's underfunded healthcare health care system is devastatingly overburdened with the surging second wave. Popular government-aided hospitals and/or medical institutes, which were already overcrowded before the epidemic, generally require guidance for better treatment. Patients report that non-medical staff attend to COVID-19 patients in most cases at the Institute of Medical Science BHU, Varanasi (in the Prime Minister's constituency); doctors and nurses are not seeing general patients of the COVID-19 ward but are consulting from a distance through a speaker.

Interestingly, the Nandurbar district of Maharashtra, with a population of 1.6 million, is exhibiting a different state of affairs, with 150 vacant beds and three oxygen plants. Owing to its adequate health care infrastructure, people from neighbouring districts and states have found respite in Nandurbar and admit themselves there. Rajendra Bharud, as Collector of Nandurbar supervising the general medical administration of the district, implemented pivotal measures after the first wave in 2020, such as setting up liquid oxygen plants at the district hospitals; if the central government had implemented the same measures across the country, there may not have been a shortage of oxygen and beds across other districts and states.

The Indian government has missed out on a crucial opportunity to reduce the loss of life. The whole world now steps up to help the innocent victims of this deadly surge of the epidemic in India. A turning point has been reached only very recently. The government is now more focused on taking the right actions and has started to work towards meeting the most palpable and visceral crisis: the shortages of oxygen and additional hospitals and beds. During a pandemic, we depend on our government to succeed.

As we have seen from the mutated B.1.617 and B.1.1.7 variants, the SARS-CoV-2 virus will continue to mutate. For the general population, being vaccinated is not necessarily a reason to go out and live as usual again. It is not yet time to relax; a third wave is also predicted. It is challenging for leaders who are committed public servants to make further good decisions quickly without input from the scientific

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Superoxide Anion Radical, A Multipotent Reagent: A Review

Raghvendra Singh Raghuvanshi

Department of Chemistry, Faculty of Science, Udai Pratap (Autonomous) College, Varanasi 221002, India.

Abstract

Superoxide anion radical ($\bar{O}_2^{\bullet}$), is a reactive oxygen species (ROS) and plays a key role in various life processes. From chemical view point, it is a multipotent reagent.

Keywords: Superoxide ion, generation, chemical reactivity

Introduction

In the past two hundred years, the life supporting molecule oxygen (O_2) has been characterised, scrutinized and applied in many ways. Oxygen in the ground state tends to act like a biradical and most of its oxidation reactions proceed by one electron step involving free radical intermediates [1]. If we see the electron affinity of oxygen some involvement of superoxide anion radical ($\bar{O}_2^{\bullet}$) in biological oxidations might be anticipitated. The experimental detection of $\bar{O}_2^{\bullet}$ as a product of enzymatic reduction [2-4] of molecular oxygen recognized function of superoxide dismutases (SODs) [2], an enzymatic catalyst for the disproportionation of $\bar{O}_2^{\bullet}$ to O_2 and H_2O_2 (eq. 1, 2).

$$2\bar{O}_2^{\bullet} + 2H^{+} \xrightarrow{\text{SODs}} H_2O_2 + O_2 \qquad (1)$$

$$2H_2O_2 \xrightarrow{\text{Catalases}} 2H_2O + O_2 \qquad (2)$$

The chemistry and biology of superoxide anion radical ($\bar{O}_2^{\bullet}$) have come to the forefront of interdisciplinary research owing to its biochemical implication and as a species of relatively unexplored chemical reactivity. The ability of superoxide anion radical to exhibit multifarious reactions and its potentially damaging role in various diseases have engendered considerable interest in this unique species. $\bar{O}_2^{\bullet}$ has been incriminated to play a crucial role in numerous pathologies such as cancer, heart attack, diabetes, inflammation, acute lung injury, Parkinson's, Alzheimer's disease, renal disease and aging [3-14].

The chemistry and reactivity of $\bar{O}_2^{\bullet}$ have been the subject of considerable interest to chemist and biochemist during the past five decades. Also, the discovery that $\bar{O}_2^{\bullet}$ is a respiratory intermediate

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Biomedical Applications And Oxidative Aromatization Of Hantzsch 1,4-Dihydropyridines: A Review

Raghvendra Singh Raghuvanshi

Department of Chemistry, Faculty of Science, Udai Pratap (Autonomous) College, Varanasi 221002, India.

Introduction

The study of dihydropyridines began early in 1882, when Hantzsch disclosed the first synthesis of these compounds. Major landmarks were the isolation of NADH (reduced nicotinamide adenine dinucleotide, **Fig. 1**) and its role as a reductive cofactor, and the breakthrough of Hantzsch dihydropyridines as antihypertensive drugs. Afterwards, research also focused on NADH mimics and on the synthetic aspects of these heterocyclic systems, especially with regard to natural products and bioactive agents.[1,2]

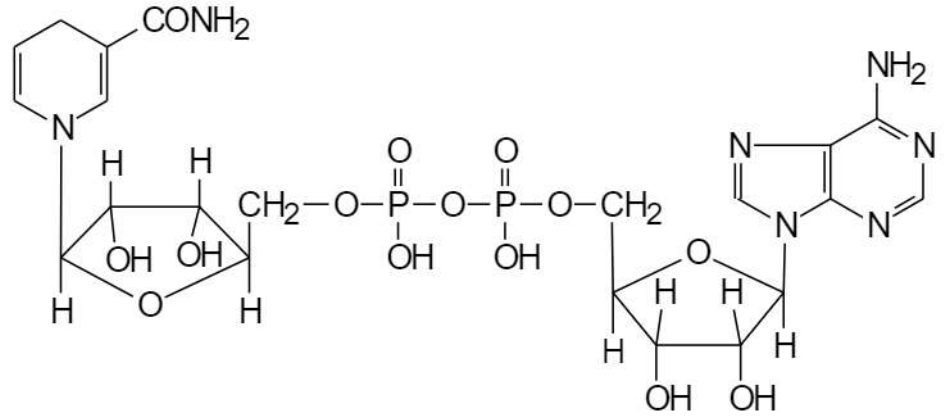

Fig. 1

The most interesting aspect of dihydropyridines can be attributed to the coenzyme NADH and the unique ability of these compounds in biological systems to reduce unsaturated functionalities and also strained ring systems (carbonyls, conjugated olefins, epoxides, etc.).[3] The mechanism of reactions mediated by NAD(P)H and its models has been extensively studied and continues to attract considerable attention because of the need to understand the finer details of the mechanism.[4,5] Concerning the reaction mechanism, one critical yet controversial issue is whether the formal hydride transfer from NAD(P)H and its model compounds to the substrates occurs by one-step direct detachment or by a multi-step sequential e^-–H^-–e^- process. Evidence has been reported in support of the e^-–H^-–e^- transfer mechanism for many thermal reactions in which strong oxidants are involved.[6] Evidence for the direct hydride transfer mechanism has also been reported in reactions with

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Research article

Synthesis, spectral analysis, molecular docking and DFT studies of 3-(2, 6-dichlorophenyl)-acrylamide and its dimer through QTAIM approach

Akhilesh Kumar Shukla [a], Aniruddh Prasad Chaudhary [b], Jyoti Pandey [a,*]

[a] Department of Chemistry, Babasaheb Bhimrao Ambedkar University (A Central University), Lucknow 226025, Uttar Pradesh, India
[b] Department of Chemistry, Udai Pratap College (An Autonomous Institution) Varanasi, Uttar Pradesh, India 221002

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ABSTRACT

In this paper, an experimental study of (*E*)-3-(2,6-dichlorophenyl)-acrylamide and its associated dimer were analysed with molecular docking, DFT and QTAIM approach. To spot, describe, and measure the non-covalent interactions (NCIs) of the atoms in the molecules of the monomer and its dimer, some important topological parameters of the charge densities, $\rho(r)$ acquired from the Bader's QTAIM tool are determined, quantitatively. The bond paths are shown to persist for a range of five types of NCIs such as weak conventional (C-H···Cl) and nonconventional (C-O···C and N-O···Cl), medium (N-H···Cl) and strong O-H···O NCIs revealed by the existence of BCPs (ranging from 1.921 - 3.259 Å). A comprehensive explanation of the spectroscopic data like vibrational, electronic, and NMR spectra is reported along with the NLO, reactivity. Hydroxamic acid exhibited an excellent nonlinear optical activity ($\beta_0 = 14.8098 \times 10^{-30}$). To predict the various reactive sites in the molecule, molecular electrostatic potential diagrams were displayed.

1. Introduction

Hydroxamic acids play a vital role in development of organic and inorganic molecules [1] and they have also being valuable intermediates in the pharmaceutical applications [2, 3, 4, 5]. The exploration of their biological activity features with different metal ions assigning to their inhibitory action against enzymes having metallo-protein as their functional group [6, 7, 8, 9]. Furthermore, hydroxamate revived metals from waste water due to significant adsorption of metals (mainly iron). As customarily, some particular metals dissolved in excess amount in water produced toxic concentration as in acid mine drainage, hazardous health problems such as excess cumulation of iron in body, posing hemochromatosis [10].

Literature study shows that the quantum chemical study on structural and spectroscopic properties and NLO (nonlinear optical) property of the titled compound is not yet reported. So, the QCCs with the density functional theory (DFT) approach have been used to investigate the theoretical aspects of titled compound. The curiosity of synthesis of hydroxamate was arising in our mind due to their biological properties and higher first order hyperpolarizability values. Since, molecule showing excellent nonlinear optical properties is used in optoelectronic devices, optical modulation, molecular switching, optical memory and frequency doubling [11, 12]. By optimizing donor-acceptor strength of the π-conjugated systems, the non-linear optical (NLO) result of a molecule can be enhanced and synthetically modelled [13]. The quantum chemical calculations (QCCs) are playing significant role for understanding of the electronic polarization and intermolecular interactions.

The synthesized aryl acryl amide has been analyzed by different spectroscopic methods. In the current work, we described the DFT calculation on molecular structure and spectral properties, electronic features and docking analysis, hydrogen bonds (HBs) and NLO result of the titled system. In the sequence of the structure-activity relationship (SAR), the molecular electrostatic potential (MEP) data have also been shown. QTAIM (quantum theory of atom in molecule) tool has been implemented to analyse the TPs (topological parameters) at the bond critical points (BCPs) and demonstrate the nature of the conventional and nonconventional noncovalent interactions (NCIs).

2. Material and method

Commercially accessible reagent grade chemicals were utilized. All reactions were followed by TLC on E. Merck Kieselgel 60 F_{254}, with recognition by UV light, spraying 20% aq. $KMnO_4$ arrangement and additionally showering 4% ethanolic H_2SO_4. Column chromatography was performed on Silica Gel (60–120 mesh, E. Merck). IR spectrum was recorded as thin films or in KBr arrangement with a Perkin–Elmer

* Corresponding author.
E-mail addresses: jyotipandey@bbau.ac.in, anirudhraj0002@gmail.com (J. Pandey).

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REGULAR ARTICLE

Complexation of Mono-anionic Bidentate Ligand Dithiocarbamate with σ-Aromatic M_3^+ Clusters: A DFT Study

VINEET KUMAR SINGH, ANSHU SHRIVASTAVA and ASHUTOSH GUPTA*
Department of Chemistry, Udai Pratap Autonomous College, Varanasi 221002, Uttar Pradesh, India
E-mail: ashu1809@gmail.com

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Abstract. The present study deals with a computational investigation on the role of dithiocarbamate (DTC) anions in the stabilization of σ-aromatic trinuclear mono-cationic metal clusters (M = Cu, Ag and Au). Electrostatic potential, aromaticity, binding energy, thermodynamical parameters and nature of bonding are estimated. Nucleus independent chemical shifts (NICS) and their variants such as $NICS_{total}$ and FiPC-NICS are employed to calculate aromaticity. The nature of bonding is assessed by the quantum theory of atoms-in-molecules (QT-AIM) and NBO methods. The charge density map in the complex has been assessed by molecular electrostatic potential analysis. Comparison of complexation properties of DTC ligand to common monodentate ligands (pyrazolates, NHC, pyridine, furan and isoxazole) explored in past reveal that DTC anions are more efficient in stabilizing metal complexes.

Keywords. σ-Aromaticity; Density Functional Theory; Critical Points; Quantum Theory of Atoms-in-Molecules; Dithiocarbamate anion; Nucleus Independent Chemical Shift.

1. Introduction

The family of dithiocarbamate acids and their anionic salts constitute an important class of molecular species with multiple useful properties and are extensively used in agriculture, medicine and the rubber industry.[1–3] Their anions are known as dithiocarbamate anions (R_2NCSS^-, Figure 1), are easily obtained from the reaction of carbon disulphide with secondary amines in presence of a base.[4–6] Ammonia reacts with carbon disulfide in alcohol or ester solvent to give ammonium dithiocarbamate salt.[7] DTC anions are planar in structure and sterically less demanding. These anions act as bidentate ligands with both sulphur atoms available to chelate with metal centres.[8] Based on binding energy values, DTC anions show strong affinity towards electron-deficient centres and therefore these are found suitable to stabilize higher oxidation states of transition metals.[9] DTC anions are therefore used as efficient chelators to remove heavy metals like Pb, Zn and Cd from polluted water.[10] Coordination chemistry of complexation of DTC anion with transition metals, main group metals and lanthanides has been previously explored in detail.[11–13] The unique and diversified role profile of DTC anions is attributed majorly to the existence of its stable resonance forms.[14] Similarly, in a recent mechanistic study on the conversion of monosulfiram (used in the treatment of scabies) into disulfiram (used in the treatment of alcoholism), we found DTC radicals also play an important role.[15]

In recent years, there has been a surge in synthesis, isolation and exploration of properties of all-metal inorganic clusters. Boldyrev *et al*., pioneered in synthesizing such all-metal aromatic compounds e.g. Al_4^{2-} and related clusters which are found to obey classical rules of aromaticity.[16] Due to this inherent existence of aromatic character, these clusters are comparatively more stable and exhibit useful chemical properties.[17] The classical concept of Huckel's aromaticity[18] i.e., (4n+2) π-electron rule which has established itself as a powerful tool for organic molecules is now extended to σ bonded metal clusters and cages too and such systems are known as σ-aromatic.[19] Such inorganic systems obey most of the

*For correspondence

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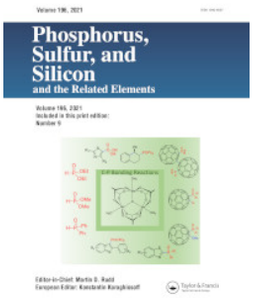

Phosphorus, Sulfur, and Silicon and the Related Elements

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A mild desilylation of phenolic *tert*-butyldimethylsilyl ethers using *in situ* generated tetraethylammonium superoxide

Surabhi Pandey, Ajay K. Shukla & Raghvendra S. Raghuvanshi

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Design, synthesis, antibacterial evaluation, molecular docking and computational study of 4-alkoxy/aryloxyphenyl cyclopropyl methane oxime derivatives

Aniruddh Prasad Chaudhary [a,c,*], Akhilesh Kumar Shukla [b], Padam Kant [c]

[a] Department of Chemistry, Udai Pratap College, Varanasi, 221002, India
[b] Department of Chemistry, Babasaheb Bhimrao Ambedkar University (A Central University), Lucknow, 226025, UP, India
[c] Department of Chemistry, University of Lucknow, Lucknow, 226007, India

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ABSTRACT

A series of new 4-alkoxy/aryloxyphenyl cyclopropyl methane oxime derivatives **2(a–k)** were synthesized and fully characterized by FT-IR, 1H-NMR, 13C-NMR and Mass spectrometry techniques. All the synthesized compounds **2(a–k)** were assayed for *in vitro* antibacterial activity against a selected bacterial strain and the compound (**2 h**) and (**2k**) exerted excellent activity against *Staphylococcus aureus*, *Escherichia coli* and *Salmonella typhi* strains. The potency of inhibitors and possible interaction mechanism of synthetic oxime (**2k**) with 1GQN enzyme on *Salmonella typhi* was explored by molecular docking method. Amongst the all synthesized compounds, the quantum chemical calculations were done for Cyclopropyl(4-(pyridin-3-ylmethoxy)phenyl)methanone oxime (**2k**). The first hyperpolarizability calculation performed in different solvent such as $CHCl_3$, CH_2Cl_2 and DMSO and compared to the reference compound urea. In addition, natural bond orbital analysis (NBO), local reactivity descriptors, thermodynamic properties, Mulliken charges, molecular electrostatic potential (MEP), frontier molecular orbitals (FMO) analysis were explored using theoretical calculations.

1. Introduction

During past few decades microbial infection is causing a serious problem on animal and human beings in the worlds. Medicinal chemists have carried out a number of modifications by installing various active compounds with oxime moiety giving access to different biological activities. The oxime and oxime ethers were shown a broad spectrum of biological activity (Miyabe et al., 2005; Ortiz-Marciales et al., 2005; Abele et al., 2004). Their potential applications in fields of medicine have been explored enormously such as fungicide (Xie et al., 2014; Wang et al., 2015), insecticide (Dai et al., 2014; Song et al., 2013), acaricide (Yongqiang et al., 2014), antioxidant (Ozyurek et al., 2014), anticancer agent (Dai et al., 2016; Kaminskyy et al., 2012), antibacterial agent (Barvea et al., 2011; Hania, 2009; Krishnan et al., 2015; Bandyopadhyay et al., 2015; Huang et al., 2015; Qina et al., 2018; Khan et al., 2012; Huang et al., 2018a) and antineoplastic agent (Huang et al., 2018b). In inorganic chemistry, oxime moiety is used as versatile ligands. The stability of oxime containing complexes with various metals exhibit good antitumor, DNA binding, antioxidant and antimicrobial activities (Görgülü and Dede, 2019; Zengin et al., 2019; Yang et al., 2017). Owing to their chemical stability and biological activity, they are known to elicit a wide range of biological responses. This has inspired synthetic chemist to initiate the preparation and pharmacological evaluation of a large number of oxime and oxime ethers based molecules and some of them have found their way as an important core structure subunit of drug molecules/candidates.

On the other side, literature study revealed that nature has endowed the chemical planet with a wealthy and diverse collection of Cyclopropane containing secondary metabolites. Several cyclopropane containing natural products have been extracted from plants, fungi and microorganisms (Liu and Walsh, 1987; Reissig, 1996; Wessjohann and Brandt, 2003; David Chen et al., 2012) and displayed various structural classes including the terpenoids, steroids, fatty acid metabolites, pheromones, and unusual amino acids that exhibit a broad array of biological properties such as insecticidal (Yang et al., 2020), herbicidal (Symon et al., 2005), antitumor (Qiu et al., 1998), antiviral (Nanjundaswamy et al., 2007), antibacterial (Maruoka et al., 2008) antifungal (Burmudzija et al., 2017) and antibiotic (Elliott et al., 1973; Castillo et al., 1998;

* Corresponding author at: Department of Chemistry, Udai Pratap College, Varanasi, 221002, India.
E-mail address: anirudhraj0002@gmail.com (A.P. Chaudhary).

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AN OBSERVATION ON CARYOPSIS MORPHOLOGY OF SOME CONGENERIC TAXA OF THE FAMILY POACEAE

AJAI KUMAR SINGH* and MANISH KUMAR SRIVASTAVA

Department of Botany, Udai Pratap College (Autonomous), Varanasi (U.P.)

ABSTRACT : Caryopsis morphology of eight congeneric taxa belonging three genera *viz. Brachiaria* (four species), *Cenchrus* (two species) and *Dactylocxtenium* (two species), collected from different parts of Eastern Uttar Pradesh, are analyzed from morpho-taxonomic view point. The parameters employed for the differentiation of caryopses morphologically of reported taxa are Apex, Base, Colour, Compression, Embryo (percentage, size and type), Length, Breadth, Length/Breadth ratio (L:B), Shape, Scutellum shape, Striations, Texture and Ventral groove. The recorded morphological attributes are found relevant from taxonomic view point, showing taxonomic relevance of caryopsis morphology at congeneric level.

Key words : *Caryopsis diversity, Morpho-taxonomic significance.*

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LAND-USE CHANGE DRIVEN IMPACT ON SOIL QUALITY THROUGH THE SOIL PROFILE IN THE DRY TROPICAL REGION OF INDIA

Mahesh Kumar Singh, Chandra Mohan Kumar, Sunil Singh, Alka Singh and Nandita Ghoshal*

Centre of Advanced Study in Botany, Department of Botany, Institute of Science,
Banaras Hindu University, Varanasi, India.

Abstract

The impact of land-use change on soil physicochemical properties was studied through upper (0-10 cm), middle (10-20 cm) and lower (20-30 cm) soil layer during summer season involving natural forest, degraded forest, agro ecosystem, and *Jatropha curcas* plantation. Land-use change from natural forest to agro ecosystem, had negative impact on soil organic carbon, total nitrogen, porosity, bulk density and water holding capacity. *J. curcas* plantation on cleared patches of degraded forest increased soil organic carbon, total nitrogen, porosity, water holding capacity but decreased soil bulk density compared to degraded forest and agro ecosystem at all the soil depths. It is suggested that *Jatropha curcas* plantation improved various soil physicochemical properties that were rendered disproportionate during land use changes. Hence it may be adopted as the alternative for restoration of degraded lands.

Key words: Land-use change, *Jatropha*, physicochemical properties, dry tropics, soil depth

Introduction

Land-use change is responsible for the release of 120 Pg carbon since 1850 globally (Houghton, 2005) and currently, the rate of carbon loss from soils in tropical regions due to land-use change, is about 1.6 ± 0.8 Pg C y^{-1} on one hand, (Smith, 2008) and land degradation on the other (Zhao *et al.,* 2005). Conversion of natural forest to agro ecosystem (perturbed ecosystem) with periodical input and output of organic matter and modified biotic and abiotic environment, has lost 75% of the carbon pool in dry tropical regions (Lal, 2004). Changes in land-use practices affect not only soil organic carbon but also the soil nitrogen and other physicochemical properties (Cambardella and Elliott, 1992, Srivastava *et al.,* 2020). Most studies evaluated the effect of land-use change on distribution and storage of soil organic carbon and nitrogen (Wu *et al.,* 2003; Zhou *et al.,* 2007; Yan *et al.,* 2012; Kucharik and Brye, 2013), nevertheless, studies on other physicochemical properties with respect to dry tropical regions are almost lacking. It is a prerequisite in terms of sustainable management of lands to evaluate the impact of the land-use change on soil properties such as organic carbon, total nitrogen, bulk density, porosity and water holding capacity. Land-use change also affects soil properties by altering the transport of organic matter in the deeper soil horizon either through variations in the belowground input of organic matter or surface mixing by soil organisms (De Gryze *et al.,* 2005). Therefore, studies on deeper soil horizons regarding soil properties are much needed to decipher the complete scenario of impact of land- use change on soil properties.

Conversion of natural forest to other land-use types leads to degradation of soil physicochemical properties with regard to soil organic matter, nutrient contents along with the climate change, biodiversity loss, reductions in soil fertility, and changes in ecosystem services (Tilman, 2001; Ashagrie *et al.,* 2007). Therefore, monitoring and mitigating the negative effects of land-use change while adopting sustainable management practices for the essential resource such as soil, is by now, the major issue. Land-use change significantly affects the soil processes and properties especially soil functioning (Post and Kwon, 2000), that can be examined through estimates of soil physicochemical properties (Shukla *et al.,* 2006, Manpoong and Tripathi, 2019).

Major drivers responsible for the degradation of natural forests are, repeated and/or intensive disturbance

***Author for correspondence :** E-mail : n_ghoshal@yahoo.co.in

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My Friend, My Dolphin

Sanjay Kumar Srivastava
Fish Physiology and Toxicology Laboratory, Department of Zoology,
Udai Pratap College, Varanasi
Shashi Kant Dwivedi
Department of Physics, Udai Ptratap College, Varanasi

Many centuries ago, there was a musician. He was very popular in public and was respected by the King also. Unfortunately, once the King got annoyed of him as he did not agree to compromise with truth and honesty. The King ordered his sepoys (सिपाहियों) to throw away the musician in middle of Sea. The sepoys took him in a boat into the middle of Sea, but before throwing him away, as per the rule, asked him about his last wish. The musician asked them that before dying, he just wanted to sing his favourite song. The sepoys did not see any harm in it and allowed him. The musician started to sing a sweet melody. The sound waves of the melody interacted with the Sea waves, and an aquatic creature was attracted towards the boat. As soon as he finished the melody, the sepoys threw him into the Sea and went back, as they knew that he did not know swimming. But the aquatic creature swimming by the side of boat pushed him up through his snout, carried him on her back and took him to the shore. The creature was a Dolphin.

The above story could of course be a fiction. But it certainly describes the friendly nature of Dolphins.

Fig.1- A leaping Gangetic Dolphin

Dolphins are well known for their agility and playful behavior. They are incredible, socially skilled, intelligent, agile, joyful, and playful creatures that share many emotional similarities with humans. They are extraordinarily intelligent animals who are of course known to display cultural behavior with human beings. Dolphins have been observed teaching their young ones how to use tools and have several highly developed forms of communication. They have a "Signature Whistle" which allows other individuals to recognize them. They are altruistic animals known to stay with and help their injured fellows and even helping them to reach the surface to breath. Their compassion even extends across the species barrier.

William Roxburgh and Heinrich Julius Lebeck are associated with the first description of the Gangetic Dolphin in 1801. Dr. Roxburgh who named it Delphinus gangetica (Pilleri 1978). In 1828 Rene Lesson adopted a genus based on the Bengali name 'Susuk' and described the species as *Susu platanista*. However, Johann Wagler adapted *Platanista* as a genus in 1830 and from then onwards it is known as *Platanista gangetica*. The Indus and Ganga populations were long regarded as identical. However, Pilleri and Gihr (1971) divided them into two species based on differences in skull structure, but Kasuya (1972) reduced the two taxa

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Banaras Hindu University, Varanasi, India.

Plants as a Source of Potential Antioxidants and Their Effective Nanoformulations

Manish Kumar[#1], Vinay Pratap[#1], Ashwini Kumar Nigam[2], Brajesh Kumar Sinha[2], Manoj Kumar Singh[3], Jalaj Kumar Gour[*1]

[1]Department of Biochemistry, Faculty of Science, University of Allahabad, Prayagraj – 211002, India. manishbhaskar2013@gmail.com, manishbhaskar2013@gmail.com, vinaypratap49@gmail.com, jalaj19biochem@gmail.com*
[2]Department of Zoology, Udai Pratap College, Varanasi – 221002, Uttar Pradesh, India. aknbhu@gmail.com, bksupc@gmail.com
[3]Centre for Non Communicable Diseases (NCD), National Centre for Disease Control, Delhi – 110054, India. mannbiotech777@gmail.com

Abstract: **Antioxidants act as weapons to neutralize the damaging effects of free radicals that are produced in the living systems during cellular activities and are responsible for a number of diseases. Plants are the major source of antioxidants in the form of enzymatic as well as non-enzymatic which is proved by several pieces of research on various natural products that have the potent capability to mimic the deleterious effects of free radicals. Among several antioxidants, the non-enzymatic antioxidants such as polyphenols, vitamins, carotenoids, glutathione, etc. have been isolated and screened for anti-oxidant properties from several food sources. Unfortunately, the effects of these natural antioxidants are limited due to their reduced absorption, hindrance in crossing the cell membranes and its degradation in the pathway during delivery, etc. To overcome these troubles and for effective, targeted delivery of antioxidants, its gradual and sustained release, nanoformulations of natural antioxidants are the key players in the enhancement of effectiveness and their release at the specific targeted site in the treatment of several diseases. This review focuses on the current advancements in the field of natural antioxidants and their nanoformulations with potent and enhanced action in minimizing the damaging effects of free radicals.**

Index Terms: **Antioxidant, free radicals, reactive oxygen species, nanoformulation, nanoparticles.**

I. INTRODUCTION

Free radicals are molecular species containing unpaired an electron capable of independent existence (Lobo et al., 2010). The presence of the unpaired electron in the atomic orbital of free radicals makes them highly unstable and reactive, which facilitates them to donate or accept electrons and act as either oxidant or reductant (Young et al., 2001). The presence of the unpaired electron in the atomic orbital of free radicals makes them highly unstable and reactive, which facilitates them to donate or accept electrons and act as either oxidant or reductant (Young et al., 2001). The major free radicals associated with health disorders are reactive oxygen species (ROS), reactive nitrogen species (RNS) and reactive sulphur species (RSS) e.g. oxygen singlets, superoxides, hypochlorite, hydrogen peroxide, hydroxyl radical, nitric oxide, and peroxynitrite radicals (Lobo et al., 2010). Free radicals play an essential role in various biological activities like a non-specific host defence mediators, cell signalling, killing of tumour cells. However, their excess damages biologically relevant molecules such as carbohydrates, proteins, lipids and nucleic acids (Young et al., 2001; Pham-Huy et al., 2008) resulting in cellular damage and homeostatic disruption. Free radicals are generated during the normal essential metabolic processes in the human system as a by-product of both enzymatic and non-enzymatic reactions, however, exposure to physical agents such as X-rays, ozone, nicotine, air pollutants and certain industrial chemicals (Bagchi and Puri, 1998; Devasagayam et al., 2004). The endogenous production of free radicals takes place through enzymatic and non-enzymatic reactions of respiratory chain, cytochrome P-450 system, prostaglandin synthesis, mitochondria, peroxisomes, xanthine oxidase, arachidonate pathway etc. (Lobo et al., 2010; Phaniendra et al., 2015; Uttara et al., 2009). The free radicals produced generally leads to damage of cellular membranes, subcellular organelles, and biomolecules leading to impairment of normal cellular functioning (Phaniendra et al., 2015). At the systematic level free radicals induced oxidative stress results in the hastening and development of several health disorders including Alzheimer, Parkinson, acute renal failure, cancer, radiation injury, diabetes, cardiovascular diseases and even ageing (Koltover, 2010; Gupta et al., 2015).

* Corresponding Author, # Authors Contributed Equally

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Innovation The Research Concept

Effects of Starvation on NSCs of *Dysdercuskoenigii, in Relation to its Natural Control*

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Ashutosh Mishra
Assistant Professor,
Dept. of Zoology,
T.D.P.G College,
Jaunpur, Uttar Pradesh,
India

B.K Sinha
Assistant Professor,
Dept. of Zoology,
U.P. P.G College,
Varanasi, Uttar Pradesh, India

D.S Shukla
M.D,
Icon Private Limited
Varanasi, Uttar Pradesh,
India.

Abstract

Starvation significantly affected to neurosecretory cells(NSCs) of adults Dysdercuskoenigii. Starvation in day 1 old adults shows accumulation of neurosecretory materials (NSM) in NSCs that continues day 3 and shows clumping of NSM. Its further continuation on day 4 causes formation of blobs in NSCs but on day 5 disappearance of NSM, pycnosis and disintegration of NSCs, the same results are also observed in day 30 old adults.

Keywords: *Dysdercuskoenigii*, Brain, NSCs, NSM, Starvation.

Introduction

*Dysdercuskoenigii*is an important cotton pest severely affected to cotton and other growing crops. In insects brain some cells involved in secretory activity called NSCs, its product is neurosecretory material (NSM) which controls all most all the physiology of insects ([1],[2],[3]). From several years entomologists and other biologists are carrying research to search a novel and natural ways to control the harmful insects population because use of insecticides causes many harmful effects to human population and also damages to natural ecological chains ([4] ,[5]) , which is not good for future ecology and biospheres. In this concern more studies are required about Insect physiology, the present investigation carried in this regard to know more about Insect physiology and helps in search of natural ways to control Insect population.

Aim of the Study

To search the biological method to control harmful insect and enrich the academic knowledge regarding effects of starvation on NSCs of *Dysdercuskoenigi.*

Materials and Methods

To build up the culture, the *Dysdercuskoenigii* were raised in glass jar in BOD incubator set at 28°C±1, 16 hr photoperiod and 75 % RH. They were fed on water soaked cotton seeds and water provided in homeopathic vials plugged with cotton. A strip of blotting paper folded into fan like fashion was slipped around the inner wall of the culture jars to enable the Insect to climb and descend in the folds and to get a semblance of natural environment. The jars were covered with muslin cloth and rubber -band. The food and water were changed everyday. Newly emerged (0 hrs) adults were sorted out and kept starved in separate jars up to seven day because after this they dies, in BOD incubator set as described earlier. The stored insects were sacrificed, their brain were dissected out and processed for the study of NSM content within the NSCs. For staining of NSCs stain aldehyde fuschin (AF) uses by applying technique of Dogra and Tandon ([6]).

Results

Though the initial starvation for varying length of time inhibits the release of NSM in the NSCs of adults. An initial starvation of day 1 adult shows accumulation of NSM in NSCs Fig.1. The starvation of day 3 shows clumping of NSM in the NSCs Fig.2 and the starvation of day 4 causes accumulation of NSM to form large blobs which are clearly seen at the periphery of the NSCs and the nuclear area starts to disappear Fig.3. The starvation of day 5 results into disappearance of NSM, pycnosis and disintegration of cells before death of experimental insect Fig.4. In comparison to normal adults the NSM content accumulation and release observed in the NSCs of adult Fig.5. The blob formation, vacoulization,

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Research Article

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Evaluation of Antioxidant Potential of *Hedychium spicatum* Rhizome Extracts from Bhowali Region, Uttarakhand, India

Manish Kumar[1], Vinay Pratap[1], Manoj Kumar Singh[2], Ashwini Kumar Nigam[3], Parikshit Kumar[4], Jalaj Kumar Gour[5]*

[1]Research Scholar, Department of Biochemistry, Faculty of Science, University of Allahabad, Prayagraj, India
[2]Assistant Director, National Centre for Disease Control, Delhi, India
[3]Assistant Professor, Department of Zoology, Udai Pratap College, Varanasi, (U.P), India
[4]Assistant Professor, Department of Botany, H.V.M. (PG) College, Raisi, Haridwar, Uttarakhand, India
[5]Assistant Professor, Department of Biochemistry, Faculty of Science, University of Allahabad, Prayagraj, India

***Address for Correspondence:** Dr. Jalaj Kumar Gour, Assistant Professor, Department of Biochemistry, Faculty of Science, University of Allahabad, Prayagraj-211002, India
E-mail: jalaj19biochem@gmail.com

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ABSTRACT

Background: It is well-known that different extraction methods, including the technique, solvents, time and temperature extensively influence the antioxidant activity of plant secondary metabolites. In our study, *Hedychium spicatum* was used as a plant sample, collected from Bhowali region, Uttarakhand, India, using two extracting solvents (acetone and chloroform) to explore the antioxidant activity, total phenolic and flavonoid contents (TPC and TFC).

Methods: Initial phytochemical analysis was performed by evaluating the TPC and TFC content by Folin-Ciocalteu and $AlCl_3$ colorimetric assay. For the estimation of antioxidant activity of test samples, 2,2-diphenyl-1-picrylhydrazyl (DPPH) and ferric reducing antioxidant power (FRAP) methods were used for the determination of free radical scavenging activity, respectively.

Results: The FRAP results of acetone and chloroform samples was 335.782 and 254.116 µM $FeSO_4 \cdot 7H_2O$/g of dry extract, respectively. IC_{50} values for acetone and chloroform extract were calculated and used to interpret DPPH radical scavenging activity. Both tested extracts exhibited potent DPPH radical scavenging activity having IC_{50}, 113.11 and 294.23 µg/ml for acetone and chloroform extract, respectively. The result of TPC (12.82 mg equivalent to gallic acid) and TFC (13.998 mg equivalent to quercetin/gram) of dry extract respectively.

Conclusions: The overall results exhibit the high antioxidant potentiality of acetone extract as compared to chloroform extract, which could be due to its high phenolic and flavonoid content presence.

Key-words: Antioxidant potential, free radical scavenging activity, *Hedychium spicatum*, Medicinal plants, Plant extract, IC50

INTRODUCTION

In modern time, attention has increased to find natural antioxidants as an alternative option for medicines, cosmetic and foods items, as a substitute for synthetic antioxidant compounds to minimize the possibility of toxicity [1]. Medicinal plants have been investigated as potential sources of natural anti-oxidants secondary metabolites and other activities like anti-cancer, antibacterial, anti-mutagenic [2-4].

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Phytochemicals containing phenols are present in plants which help in protecting them from ultra-violet rays, grass-eating animals and other different forms of biotic/ abiotic factors [5]. The production of secondary metabolites by the plants are usually affected by different factors such as the strength of sunlight, altitude, elevated temperature, seasonal variation, different stress conditions including biotic and abiotic factors, rainfall, maturity at harvest [6].

H. spicatum is well-known as 'spiked ginger' Lilly or perfume ginger. It is associated with the family Zingiberaceae. *H. spicatum* is mainly found in Himalayan regions of India, and it's also natives to China, Myanmar, Thailand, and Ethiopia. It's a rhizomatous aromatic green herb with a hearty stew. The rhizome of *H. spicatum* is utilized in the prevention of several diseases in the

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[2]Department of Zoology, Udai Pratap College, Varanasi – 221002, Uttar Pradesh, India. aknbhu@gmail.com, bksupc@gmail.com
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Index Terms: **Antioxidant, free radicals, reactive oxygen species, nanoformulation, nanoparticles.**

I. INTRODUCTION

Free radicals are molecular species containing unpaired an electron capable of independent existence (Lobo et al., 2010). The presence of the unpaired electron in the atomic orbital of free radicals makes them highly unstable and reactive, which facilitates them to donate or accept electrons and act as either oxidant or reductant (Young et al., 2001). The presence of the unpaired electron in the atomic orbital of free radicals makes them highly unstable and reactive, which facilitates them to donate or accept electrons and act as either oxidant or reductant (Young et al., 2001). The major free radicals associated with health disorders are reactive oxygen species (ROS), reactive nitrogen species (RNS) and reactive sulphur species (RSS) e.g. oxygen singlets, superoxides, hypochlorite, hydrogen peroxide, hydroxyl radical, nitric oxide, and peroxynitrite radicals (Lobo et al., 2010). Free radicals play an essential role in various biological activities like a non-specific host defence mediators, cell signalling, killing of tumour cells. However, their excess damages biologically relevant molecules such as carbohydrates, proteins, lipids and nucleic acids (Young et al., 2001; Pham-Huy et al., 2008) resulting in cellular damage and homeostatic disruption. Free radicals are generated during the normal essential metabolic processes in the human system as a by-product of both enzymatic and non-enzymatic reactions, however, exposure to physical agents such as X-rays, ozone, nicotine, air pollutants and certain industrial chemicals (Bagchi and Puri, 1998; Devasagayam et al., 2004). The endogenous production of free radicals takes place through enzymatic and non-enzymatic reactions of respiratory chain, cytochrome P-450 system, prostaglandin synthesis, mitochondria, peroxisomes, xanthine oxidase, arachidonate pathway etc. (Lobo et al., 2010; Phaniendra et al., 2015; Uttara et al., 2009). The free radicals produced generally leads to damage of cellular membranes, subcellular organelles, and biomolecules leading to impairment of normal cellular functioning (Phaniendra et al., 2015). At the systematic level free radicals induced oxidative stress results in the hastening and development of several health disorders including Alzheimer, Parkinson, acute renal failure, cancer, radiation injury, diabetes, cardiovascular diseases and even ageing (Koltover, 2010; Gupta et al., 2015).

* Corresponding Author, # Authors Contributed Equally

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Full Length Research Article

Effect of Farm Yard Manure (FYM), Phosphorous Solubilizing bacteria (PSB) and Sulphur on Growth and Yield of Mungbean [*Vigna radiata* (L.) Wilckzek] along with Soil Sustainability

Aditya Kumar*[1], Sanjay Kumar Shahi[2] and Avanendra Yadav[3]

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ABSTRACT

An experiment was conducted during 2020 to investigate the effect of farm yard manure (FYM), phosphorous solubilizing bacteria (PSB) and Sulphur on the growth and yield of mungbean along with soil sustainability. The various treatments applied to mungbean were control i.e., RDF (T_1), RDF + FYM @ 5 tons ha^{-1} (T_2), RDF + FYM @ 5 tons ha^{-1} + PSB (T_3), RDF + FYM @ 5 tons ha^{-1} + PSB+ 40 kg Sulphur (T_4), 125% RDF (T_5), 125% RDF + FYM @ 5 tons ha^{-1} (T_6) and 125% RDF + FYM @ 5 tons ha^{-1} + PSB (T_7). Significantly higher growth parameters like plant height, number of branches $plant^{-1}$, dry matter accumulation $plant^{-1}$, number of nodules $plant^{-1}$ was observed with 125% RDF + FYM @ 5 tons ha^{-1} + PSB (T_7). Significantly higher yield parameters like number of pods $plant^{-1}$, number of seeds pod^{-1}, test weight, seed and stover yield and protein content was also observed with 125% RDF + FYM @ 5 tons ha^{-1} + PSB (T_7). Soil sustainability in terms of soil pH, EC, organic carbon, NPK availability and uptake was also noticed significantly superior in T_7.

Key words: *Vigna radiata*, Phosphorus solubilizing bacteria (PSB), FYM, Growth, Yield, Nutrient uptake

Pulses are an important source of dietary protein throughout the world. As per the World Health Organization (WHO) and FAO per capita per day requirement of pulse in the human diet is 80g, but the production and availability of pulses declined, which is a serious concern in the present scenario. By contributing 25.5% of total global pulse production, India ranks first in both production as well as consumption of pulses at the global level. Apart from those pulses are important for farming system sustainability because of their roles in atmospheric nitrogen fixation with the help of symbiotic bacteria like *Rhizobium.* Mungbean (*Vigna radiata* L.) is one of the third most important pulse crops in India after chickpea and pigeon pea. It is an outstanding source of protein (25%) with higher content of lysine (460 mg/g) and tryptophan (60 mg/g). In India, the pulses are cultivated mainly in rainfed conditions. In 2017-18 total pulse production was 25.23 million tonnes from 29.99 million ha area (Directorate of Economics and Statistics). In the year 2017-18 total area under mungbean in India was 4.1 million ha with an overall production of 1.9 million tonnes (Ministry of Agriculture and Family Welfare). More than 80 per cent of mungbean production comes from Rajasthan, Madhya Pradesh, Maharashtra, Bihar, Karnataka, TN, Gujarat, Andhra Pradesh, Odisha and Telangana. The total area under Mungbean during the 11th plan was 33.32 lakh ha, whereas it was decreased to 30.41 lakh ha during the 12th plan and productivity was 468 kg ha^{-1} [1]. Organic manure like FYM is well recognized for improving macro and micronutrients availability. It provides 0.5% N, 0.2% P_2O_5 and 0.5% K_2O. It improves soil health through its beneficial effect on amending the physical, chemical and biological properties of soil. FYM facilitates in proper aeration and water holding capacity of the soil and helps in the more efficient utilization of chemical fertilizers. Apart from that, it helps in increasing the population of soil micro-organisms that enhances the availability of plant nutrients in the soil. Insoluble reserves of phosphorus are made available to plants after solubilization by PSB like Pseudomonas and Bacillus. Beneficial microbes' resident to the rhizosphere are receiving greater attention, as they can solubilize inorganic phosphate into soluble form through the process of acidification, chelation, exchange reactions and production of organic acids [2]. In addition, these phosphate solubilizing microorganisms (PSMs) can also increase the growth of plants by other mechanisms i.e., production of phytohormones such as IAA [3] which promotes plant growth. Fungi were more efficient than bacteria in solubilizing insoluble phosphate [4]. Although, strains of *Aspergillus* and *Penicillium* spp. are the most common fungi

* **Aditya Kumar**
✉ aadi.bhu@gmail.com

[1-3] Department of Agricultural Chemistry and Soil Science, Udai Pratap Autonomous College, Varanasi - 221 002, Uttar Pradesh, India

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Pattern of Calf Mortality in Gangatiri Cattle at Araziline Organized Dairy Farm of District, Varanasi

Shiv Bachan[1], K.B. Anand[1], R.K. Pal[2] and Aditya Kumar[3]
[1]U.P. College, Varanasi, Uttar Pradesh [2]T.D. College, Jaunpur, Uttar Pradesh [3]Janta College Etawah, Uttar Pradesh

Abstract

Pattern of calf mortality to study of the objectives in Gangatiri breed of cattle. The information were collected from the record of Gangatiri herd, maintained at Government cattle farm Arajiline block of district Varanasi. The data was recorded for a period of 12 years (from 2008-2020). The period wise distribution of calf mortality presented that highest mortality rate (16.50%) was recorded in the period P4 (2012-2018) and the lowest mortality rate (7.50%) was showed in P2 (2010-2015), Disease-wise distribution of calf mortality presented that it was maximum (8.53%) in gastrointestinal troubles in both sex and the minimum calf mortality rate was found in tympany 2.46 percent , which might be due to better management practices given to this age group. The mortality rate from season to season from winter to rainy was also calculated. Season-wise distribution of calf mortality presented that the high mortality of calf 5.45% was determined in those calf born in winter season, many managemental practices are also not apply for calf to proper growth and this reason increased mortality of calf.

Key words : *Mortality, calf, disease, managemental practices.*

Introduction

The mortality of calf is a most important character for breeding and economic point of view in dairy farming. More survival rate in dairy herds help increase the selection criteria, which is one of main factor regulating genetic gain and more economic benefits. Mortality was higher in male than female calf as well as was lower in winter and higher in summer season. The objectives of present study was determinate the Gangatiri cattle in respect survival of young stock and suckling practices of different sex up to 15 days of their life for obtaining about improvement in overall efficiency. Gangatiri cattle is one of the well known dual purpose breed, especially found in eastern zone of utter Pradesh and ad joining areas of Bihar.

Materials and Methods

The information of present study were collected from the obtained of Gangatiri herd, maintained at Government cattle farm, Shahanshah pur, Arajiline Block District, Varanasi. Utter Pradesh maintaining data to a period of 12 years from 2008 to 2020.

The total period of the calf mortality was divided in to three groups (p1: 2008-2012, p2: 2013-2016, p3:2017-2020). The years was divided in to three reason, Winter-October to January, Summer-Febuary to May and Rainy season- June to September.

Results and Discussion

Mortality rate on the basis of different period of the year : The mortality rate showed that the maximum (16.13%) was recorded in p1(2008-2012), which included 35.00% and 22.64% in male and female calves respectively, whereas the lowest (9.24%) was indicates that in the p2 (2013-2016) which included that 8 and 3 percent male and female calves respectively (Table-1). Second phase of calf mortality was lowest indicates that out of total 103 male calves, 33 female calves(14.89%) died, whereas out of 203 female calves a total of 23 calves (18.58%) were reported to be died. The reason of higher percentage of death in male calves than female calves. Better care and management practices would have been adopted for rearing of female calves, whereas male calves sometimes ignored. In the present study, the overall average mortality in Gangatiri calves were obtained to be 16.13%, however Mishra et. al. (2015) a higher mortality rate (18.50%) in buffaloes.

Mortality rates of calves according seasons : The overall mortality was found to maximum in winter season (5.45%) probably due to excessive low temperature below 3 and un productive managemental practices. Ghosh et. al. (1996) in different breeds of cattle and their cross reported resembling lethal factor effect of the winter season on calve mortality rate in the present study. Higher mortality in male (6.82%) than the female (3.96) percent was recorded.

Mortality rates of calves according to cause of disease : The highest mortality rate in Gangatiri calves were found due to gastrointestinal troubles (8.53%), which was due to bacterial or viral infections or due to feeding of

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Studies on Feed Consumption and Nutritional Status on Lactating Murrah Buffaloes of Rural areas of Kushinagar District (U.P.)

Rajesh Kumar Pal[1], Shiv Bachan[2] and K.B. Anand[3]
[1]*Department of Animal Husbandry and Dairying Tilakdhari PG College Jaunpur-222002, U.P.*
[2]*Department of Animal Husbandry and Dairying Udai Pratap College Vanarasi-221002, U.P.*
[3]*Department of Agronomy Udai Pratap College Vanarasi-221002, U.P.*

Abstrect

Feeding system of Murrah Buffaloes on the availability of crop residues and crop by-products and pasture and grasses on common property resources. The present work was therefore taken up the assess of the proximate compositions of commonly available feed stuffs in rural areas of Kushinagar District (UP). Feed sample were collected from 250 households were randomly selected from 10 villages of 05 block in District. Each block contain 02 village and each villages included 25 farmers. Which were categorized in to 05 groups on the basis of land holding capacity, Landless, Marginal, Small, Medium and Large categories of farmers. Each category included equal number of farmer in each village.Data were collected in winter, spring, summer, rainy and autumn season. Dry matter intake in winter, summer and autumn seasons were significantly higher in large category of farmers followed by other category of farmers. In spring seasons DMI were significantly higher in medium category of farmers followed by other farmers. Digestible crude protein and total digestible nutrient intake in Milch buffaloes were significantly differed between in all seasons under all category of farmers. DCP and TDN intake feeding were depend upon concentrate mixture feeding and economics status of farmers.

Key words : *Dry matter intake, digestible crude protein intake, total digestible nutrient.*

Introduction

India is predominantly an agrarial economy with more than 70% of the population in village depending upon agriculture. Animal husbandry and allied sector activities for the livelihood. Among many livestock enterprises, dairying is the most ancient occupation established in the rural setting of your country, dairy sector contributed significantly in generating employment opportunities and supplements less labors of rural India (1), besides providing food security. The Indian former maintain a large number of cows and buffaloes in rural areas, cow mostly maintained for producing good quality draft bullocks as well as for milk production, however buffaloes are maintained for fat rich and meat production.

Materials and Methods

The present study was conducted during the different seasons of the years 2019-2020 *viz.,* winter, spring, rainy, summer and autumn seasons. Murrah buffaloes owners were selected from different village of Kushinagar district of UP to assess the feed consumption, and milk production and its composition and feed milk relationship of buffaloes in rural areas of kushinagar. Two hundred fifty lactating Murrah buffalos were randomly selected from ten village of five blocks in kushinagar districts each block contain two village and each village included 25 farmers, which are categorized into 05 groups on the basis of land holding capacity like landless,marginal,small,medium and large category of farmer.

In present investigations data were collected with the help of questionnaire during survey from the individual farmer and by personal observation. Measurement of animal bodyweight of the individual animal was calculated by using Minnesota formula (2)

$$\text{Body weight (kg)} = L \times (G)^2 / 660$$

Where, L = Body length from shoulder point to pin bone in inch.

G = Chest girth in inch.

Order and stage of lactation of buffaloes was recorded from individual farmer during survey. The quantity of feed and fodder offered to various groups of animal during 24 hrs. were recorded by weighimg or oral inquiries, Grazing intake was also recorded. The samples of feed and fodder fed to various animals were collected (minimum 500 gm) from the owners for proximate analysis as per method of (3). The quantity of DM, DCP, and TDN intake by different animal were calculated from the record of intake of feed and fodder using average digestibility coefficient value given by (4). The dry matter intake in winter and summer seasons were35% and 20% respectively after full grazing against the standard requirement given by (5). The statically method adopted in the analysis of data by formula, (Linear model and Cobb-Douglas model).

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Assessment of Technology and Yield Gap of Chickpea in Bundelkhand Region of Uttar Pradesh, India

M. P. Singh[1], Mukesh Chand[1], B. K. Gupta[2], B. P. Mishra[2*], Amit Mishra[3], Gaurav[1] and Sunil Kumar[1]

[1]Krishi Vigyan Kendra, Mahoba, Banda University of Agriculture and Technology, Banda, U.P., India.
[2]Department of Agriculture Extension, Banda University of Agriculture and Technology, Banda, U.P., India.
[3]Department of Soil Science and Agricultural Chemistry, Banda University of Agriculture and Technology, Banda, U.P., India.

Authors' contributions

The work was carried out by the contribution of all the authors. Author MPS conducted the demonstrations at farmers field. Authors MC and BPM designed the demonstration, supervised and provided necessary support to team for smooth execution of demonstrations. Authors BKG and AM wrote the manuscript. Author Gaurav supported in data collection. Author SK statistically analyzed the data and supported in editing of manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Bundelkhand region of Uttar Pradesh (UP), India is a major pulse producer in the Indian subcontinent. The agriculture production, particularly, pulses have been playing a great role in strengthening the economic conditions and are the source of livelihood of Bundelkhand region of Uttar Pradesh state. The productivity of chickpea crop is low due to lack of adoption of best management practices of chickpea by farmers Keeping these constraints under consideration the yield gap and technology gap assessed of the region by conducting Cluster Front Line Demonstrations on best management practices of chickpea during *Rabi* seasons in the year 2015-16 to 2018-2019, respectively. The demonstration was carried out in six villages of Mahoba district.

**Corresponding author: E-mail: bkguptabuat75@gmail.com;*

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Brindaban Singh
Research Scholar, Mahatma Gandhi Chitrakoot Gramodaya Vishwavidyalaya Chitrakoot, Satna, Madhya Pradesh, India

Dr. SP Mishra
Faculty of Agriculture, Mahatma Gandhi Chitrakoot Gramodaya Vishwavidyalaya Chitrakoot, Satna, Madhya Pradesh, India

Dr. AP Singh
Assistant Professor, U.P.A. College Varanasi, Uttar Pradesh, India

Corresponding Author:
Brindaban Singh
Research Scholar, Mahatma Gandhi Chitrakoot Gramodaya Vishwavidyalaya Chitrakoot, Satna, Madhya Pradesh, India

Genetic divergence for economically important traits of chickpea (*Cicer arietinum* L.)

Brindaban Singh and Dr. SP Mishra and Dr. AP Singh

Abstract
The present investigation attempted to understand the genetic divergence among the genotypes for economically important traits. The experiment was conducted in Randomized Complete Block Design (RCBD) with two replications during *rabi* season of 2014-15 at Rahaula farm of Faculty of Agriculture, Mahatma Gandhi Gramodaya Vishwa Vidyalaya Chitrakoot (MGCGV), Satna (M.P.). The results revealed high variability of most of the economically important traits. The diversity analysis revealed grouping of 20 chickpea genotypes in five clusters. The inter- and intra-cluster distances revealed highest intra-cluster diversity in cluster I (13.81) followed by cluster III (9.84). The inter-cluster distance was highest between cluster IV and V (306.92) followed by cluster I and V (252.98), and cluster II and V (142.78). The highest contribution towards genetic variation was reported by hundred seed weight (45.26%) followed by plant height (11.05%), biomass yield per plant (8.95%) and grain yield per plant (7.89%) indicating the greater diversity in the population for these traits. The diverse genotypes identified in this study can be used a parents in the breeding program to develop future varieties.

Keywords: Divergence, inter- and intra- cluster distance, d^2 analysis, variability, yield traits, chickpea

Introduction
Chickpea (*Cicer arietinum* L.) is one of the world's most important grain legumes. It is an annual, self-pollinating, diploid pulse crop with a genome size of ~738 Mbp (Varshney *et al*., 2013) [22]. Chickpea seeds are major source of plant-based dietary protein (17-23%), carbohydrates (54-60%) and minerals such as phosphorus, magnesium, calcium, iron and zinc (Singh *et al*., 2008) [18]. It is commonly known as Chana or Bengal gram (India and Pakistan), Garbanzo (Spain), Homes, Amaz (Arab world), Garo (Portugal), Shimbra (Ethiopia) and Nahud, Lablabi (Turkey) is believed to be one of the first legumes cultivated by humans (Loss *et al*., 1998) [8]. It is originated from South East Turkeys and Syria and largely grown in semi-arid regions of the world for over hundreds of years, primarily in India, Pakistan and Middle East (Kumar and Abbo, 2001) [7]. Chickpea contributes significantly towards the agricultural sustainability through it symbiotic nitrogen fixation (Gan *et al*., 2006) [4].

Chickpea is currently grown at about 14.56 million hectares worldwide with the annual production of 14.78 million tons (FAO stat, 2017) [2]. Among legumes, chickpea ranks third in the cultivated area worldwide. The developing countries share more than 95% of the area, production and consumption of chickpea. In South East Asian countries, chickpea is largely grown with significant cultural, religious and nutritional value. India accounts about 70% in global chickpea production from 9.54 m ha area and an annual production of 9.08 Mt and productivity of 951 kg/ha (FAOstat, 2017) [2]. Six states *viz.,* Madhya Pradesh, Rajasthan, Maharashtra, Uttar Pradesh, Karnataka and Andhra Pradesh together contribute 91% of the total production and 90% area of the country. Madhya Pradesh is leading with 3.01 mha area with production of 3.35 Mt and productivity of 1115 kg/ha (MP Krishi statistics, 2015-16). The chickpea production in India has increased by 77% since 2000 largely due to increase in 55% chickpea cultivation area whereas the only 14% increase in yield has been achieved during this period. Since 2000, production of chickpea across the world has increased by 84% owing to combined effect of increase in area by 43% and yield by 28%. The yield increase in India is low as compared to the world which needs to be increased through intense efforts on developing high yielding improved varieties along with ensuring its availability to the farmers through an active seed system.

Enhancing genetic gains in chickpea for major economically important traits is one of the thrust area for scientist. For enhancing genetic gains, the diverse patents should be used in the crossing with different allele combination to get the transgressive segregants in segregating generations. Estimation of genetic divergence and characterization of genotypes helps breeders to select parents in their breeding programme to create new variability, development of

Research Article

Evaluation of Phenotypic Stability in Chickpea Genotypes Tested under Diverse Environments

Brindaban Singh[1], Vinod Kumar[2]* and AP Singh[3]

[1]Faculty of Agriculture, AKS University, Satna (M.P.)
[2]Project Coordinating Unit (Sesame & Niger), ICAR- Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur, (M.P.)
[3]Uday Pratap Autonomous College, Varanasi (U.P.)

Abstract

Twenty chickpea genotypes were studied for stability for various characters at Rahaula farm of Faculty of Agriculture, Mahatma Gandhi Gramodaya Vishwa Vidyalaya Chitrakoot (MGCGV), Satna (M.P.) during rabi seasons of 2014-15, 2015-16 and 2016-17. Analysis of variance for seed yield and its component traits revealed that the genotypes differed significantly for all the characters except plant height. Mean square due to Genotypes X Env. (linear) were significant for number of pods per cluster, number of seeds per plant, hundred seed weight, harvest index and grain yield per plant. The genotype Ujjawala, KAK 2, PG 0517, HK 1 and Shubhra were stable with above average grain yield per plant, regression co-efficient close to unit and least deviation from regression line. However, JG 16 and JG 14 were also reported as stable across the environments with regression co-efficient close to unit and least deviation from regression line, although the grain yield per plant were below the average of all the genotypes. Among the stable genotypes, KAK 2, JG 14 and JG 16 recorded regression co-efficient lower than one indicates its superiority of these genotypes under poor environmental conditions.

Keywords: Chickpea, Stability analysis, Genotype x Environment, Regression coefficient

***Correspondence**
Author: Vinod Kumar
Email: goyal.vinod@jnkvv.org

Introduction

Chickpea (*Cicer arietinum* L.) is one of the most important crops, belongs to pulse group, in the world [1]. India is the largest chickpea producer accounting a share of about 67% in global chickpea production with about 8.17 million ha area, 7.48 million tonnes production and productivity of 915 kg/ha. Distribution of chickpea in six states *viz*., Madhya Pradesh, Rajasthan, Maharashtra, Uttar Pradesh, Karnataka and Andhra Pradesh together contribute 90.2% of the production and 90.8 % of the chickpea area in the country. Madhya Pradesh covers 3.43 million ha area with production 4.61 million tonnes and productivity of 1344 kg/ha [2]. Direct selection for complex traits like seed yield is not effective. Knowledge of association of the simply inherited traits, which are less influenced by environment, is required to have sound selection criteria [3]. In any breeding programme, it is necessary to find out phenotypically stable genotypes for yield, which could perform more or less uniformly under different environmental conditions. Seed yield is a complex character and largely depends upon its component characters, with an interaction with the environment resulting into the ultimate product, i.e., seed yield. To breed a stable variety, it is necessary to get the information on the extent of genotype x environment interaction for yield and its component characters. Therefore, an attempt has been made in the present study to evaluate different chickpea genotypes across the seasons to know the role of G x E interactions and also to analyze the stability of genotypes for different traits [4].

Materials and Methods

The experiment was conducted in Randomized Complete Block Design with two replications during three consecutive rabi seasons of 2014-15, 2015-16 and 2016-17 at Rahaula farm of Faculty of Agriculture, Mahatma Gandhi Gramodaya Vishwa Vidyalaya Chitrakoot (MGCGV), Satna (M.P.) situated at the latitude of 25.14° ´N, 80.85 ‘E, longitude and an altitude of 315 meter above the mean sea level. Four row trials with 4 m row length plots were planted with inter and intra-row spacing of 30 and 10 cm, respectively. Standard agronomic practices were adopted to raise a good crop. Five healthy plants were randomly tagged in each plot to record data on various economic traits from each replication. The data collected from all the individual environments and combined across the environments were subjected to stability analysis. A two-way analysis of variance was performed and the stability parameters are computed following the model proposed by [5]. The type of stability is decided on regression coefficient (bi) and mean values [6]. If bi is equal to

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Current Position of Eco-Friendly Hybrid Rice Technology and Social Inclusion in India

Pragya Parmita
Associate Professor, Department of Genetics and Plant Breeding, Udai Pratap Autonomous College, Varanasi

Abstract

As rice is the staple food in most parts of India there is a need to increase production of rice and productivity of land under rice cultivation. In the 1960s the development of high yielding varieties provided the answer to the increasing demand in the country. Development of HYVs occurred as a result of the efforts of the public R&D institutions. Among the innovative genetic options available for enhancing the rice production Hybrid rice is one of the technology which is feasible and readily adoptable. This technology has been developed, extensively tested across the country and has been adopted in a limited area of about 1.1 million hectares at present. The paper is based on the secondary data collected from various published sources and examines the question of how inclusive is the hybrid rice technology in terms of participation of farmers in the development of technology and access to technology to all sections of farmers in different regions in the Indian context. Further, the paper attempts to examine as to how the institutional frameworks in India addressed this question. The status of hybrid rice in the country at present, the major challenges ahead and the future outlook for this technology are also analyzed in this paper.

Rice breeding has been the affair of farmers in Asia for thousands of years. In the process of collecting, selecting, exchanging, conserving and experimenting with rice plants, they have come up with well over 100,000 varieties with different characteristics. By the 1950s, white-coated laboratory scientists were getting in on the act. Chinese researchers were the first to change the architecture of the ordinary rice plant, around 1955, by systematically incorporating a semi-dwarfing gene (*sd-1*) from a specimen found in Taiwan. Traditional varieties are often tall and if you apply nitrogen fertilizer to boost their yield, they topple over. The *sd-1* gene produced medium-height rice that responded very well to chemical fertilizer. Thus, yields could shoot up. China lost no time in massively producing semi-dwarf rice, as did the International Rice Research Institute (IRRI) in Los Baños, the Philippines,IRRI was set up in 1959 by the Ford and Rockefeller Foundations of the United States. Their plan was to organize a team of top-notch scientists, build an international laboratory and provide excellent conditions for these researchers to increase rice production in Asia, with the goal of fending off social unrest. In 1966, their big breakthrough came: IR8 was released. IR8, like its Chinese counterparts, was a semi-dwarf rice; and it responded well to intensive production practices, such as those used in the United States. It spread rapidly throughout Asia, earning the nickname *"miracle rice"*.

IR8's *"genetic potential"* – the yield it can produce under ideal conditions – has never been surpassed by subsequent modern races. On average, the best varieties churn out 10 mt/ha on research stations.[7] In reality farmers get three, six, sometimes up to eight tones. This means, over time, that the yield *"ceiling"* in rice is stuck. Asian governments started complaining about this in the late 1980s and by now everyone is talking about the need to break the yield barrier. One route IRRI adopted, in classic miracle-maker style, was to try to come up with a so-called *"Super Rice"* or 15-tonner. This project implies a radical restructuring of the rice plant, once again. But IRRI has not yet succeeded.[8] The other route is hybridizing rice, which IRRI hopes will produce 13 mt/ha. Either way, the objective is the same: instead of bridging the gap

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Performance of promorising varieties of wheat under late and very late sowing conditions in Grid Zone of M.P.

KAYAM SINGH AND S.B VERMA[1]
Senior Scientist and Head,Krishi Vigyan Kendra ,Lahar, Bhind, (M.P.) Rajmata Vijayaraje Scindhiya, Krishi Vishwa vidyalaya, Gwalior (M.P.)

Abstract

A field experiment (crop cafeteria) was conducted during Rabi season 2016-17 and 2017-18 at Krishi Vigyan Kendra, Lahar Bhind (M.P.) entitled to study the performance of six wheat varieties under late and very late sowing conditions. The experiment was laid out in split plot design with twelve treatment combinations in three replications. Treatments consisted of two sowing conditions i.e. late sown (15.12.2016) and very late sown (10.01.2017) in main plots and six wheat varieties viz. MP 4010, K-7903, WH-1129, GW-273, HD-3059 and WH-1021 in the sub plots. The results revealed that there was no statistical difference among sowing dates for yield and yield attributing characters, but significant differences were observed among different varieties in relation to yield and yield contributing parameters like effective tillers (m^{-2}), number of grains per spike and 1000 grain weight (g). Among varieties, HD3059 was the top yielder (45.28 qha^{-1}) which proved significantly superior rest of the treatments, variety MP-4010 and K-7903 can be considered as best variety for growing in late and very late sowing conditions.

Keywords: Wheat variety, Late sown , Very late sown, Weed Management

Introduction

Wheat crop is an important among cereals. It is high source of protein, good source of fibre and good in manganese and magnesium in the grid zone of Madhya Pradesh.. Its area and productivity is increasing rapidly across the globe, due to its wider adaptability and sustainability under diverse agro climatic conditions (Kumar *et al.,* 2014). There are various factors, which are responsible for low yield of wheat crop in the country but among these sowing time and and varietal selection are of primary importance. Wheat is the main crop of winter season and it has its own definite requirements for temperature and light for emergence, growth and flowering (Dabre *et al.,* 1993). Selection of suitable crop varieties according to the agro climatic conditions may play crucial role in realizing the optimum production of any crop commodity (Singh *et al.,* 2008). Delay in sowing results in poor tillering and crop growth is generally slow due to low temperature. In late planting the wheat variety should be of short duration that may escape from high temperature at the grain filling stage (Phadnawis and Saini, 1992). Late sowing results in reduction of yield contributing characters like number of tillers and number of grains per spike (Ansary *et al.,* 1989). The release of new varieties is a continuous process and different varieties perform differently under different sowing conditions. Therefore, the present study was conducted to judge the performance of various wheat varieties under late and very late sowing conditions.

Materials and Methods

A field experiment (crop cafeteria) was conducted during Rabi season 2016-17 and 2017-18 at Krishi Vigyan Kendra, Lahar Bhind (M.P.). The experimental soil was loam in texture low in organic carbon, available phosphorus and potash and high in pH and electrical conductivity. The 12 treatments were executed in split plot design with three replications. The treatments comprised of two sowing dates in the main plots and seven varieties in the sub plots. The dates of sowing were 15.12.2016 (Late sown

[2]Department of Agriculture Botany
(GBP) Udai Pratap College,Varanasi (U.P)

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Effect of soybean varieties sowing time on seed yield and yield attributes in Malwa Plateau region

KAYAM SINGH, LAL SINGH, S.B. VERMA[1] AND BHAGWAN KUMRAWAT
RVSKVV, Krishi Vigyan Kendra Rajgarh, (Biaora) M.P.,

Abstract

The Experiment were conducted during Kharif season in the year of 2018 & 2019 at farmer field with light to heavy soil and rainfall varies from 750-1250 mm in Malwa plateau region of Madhya Pradesh, India. The effect of three sowing dates on the growth, development and yielding of Three soybean cultivars of different time of Sowing and under different temperature and precipitation conditions across the years. The seed yield from early sowing significantly correlated with the total precipitation in June and July, and at later dates, also with the total precipitation in August. The significantly highest soybean yields were collected from the sowing at a turn of May, and the highest seed and protein yield, as well as protein content in seed, were re- corded for the early JS 2034 cultivar. Neither the number and the seed weight per pod nor the 1 000-seed weight significantly depended on the sowing date. Over years, a significant, almost linear decrease in the plant height and the first pod setting height, the weight of nodules, the protein yield. And highly significant correlations were found between the seed yield and the plant height and the first pod setting height, as well as between the seed number and the seed weight per pod and the 1 000-seed weight as well as between the plant height and the first pod setting height.

Keywords: sowing time effect; weather conditions; plant morphology and Seed yield

Introduction

The Experiment were conducted during Kharif season in the year of 2018 & 2019 at farmer field with light to heavy soil and rainfall varies from 750-1250 mm in Malwa plateau region of Madhya Pradesh, India., it is observed that some farmers are interest in soybean cultivation at a larger scale in Central Malwa Plateau region of Madhya Pradesh especially in Rajgarh District area most favorable to soybean growing in that relatively new soybean region, the research is necessary to determine the effect of environmental variation and cultivation technology, especially the date of sowing, on soybean growth, development and yielding. However, only four countries, Italy, France, Romania and Serbia, record continuously growing seed yields (Bastidas et al. 2008), and it is estimated that even 20% (of about 2.4 million ha) of the soybean imports can be replaced by its cultivation in Eastern Europe. One of the most important soybean cultivation conditions is the earliness of the cultivars grown as plant development, and ripening is closely related to the day length. It is commonly believed that in Rajgarh, it is possible to grow soybean wherever the growing season is 90–100 days long, namely the cultivars with JS 2034, early sowing which means that the total temperature required for the growing season should range from 20 °C to 35 °C (Berschneider 2016). The analysis of the changes in weather parameters Malwa plateau region condition the shortening of the active soy- bean growth, prolonging the time the soil heats up to 8 °C at a depth of 5 cm, and to the occurrence of weather and agricultural droughts as well as late- spring ground frosts (Zarski et al. 2019). The optimal soybean sowing date is an important factor affecting the plant growth and yield, and it changes depending on the climate conditions and the accompanying reactions of cultivars to the day length Sincik et al. 2011.

An earlier sowing date stands for a longer period of vegetative and generative development as the soybean seed yield is positively correlated with the length of flowering, pod setting and seed-filling

[1] Assistant professor (GBP), Department of Agriculture botany (GBP) Udai Pratap Colllage, Varanasi (U.P.)

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Analysis of Cultural and Pathogenic Diversity in *Bipolaris sorokiniana* Causing Spot Blotch of Bread Wheat in North India

Amit Chauhan[1*], Lokesh K. Mishra[2], R. V. Singh[3] and Ramji Singh[4]

[1]U.P. (Autonomous) College, Varanasi, Uttar Pradesh, India.
[2]College of Agriculture, Central Agricultural University, Imphal, Manipur, India.
[3]ND University of Agriculture and Technology, Ayodhya, UP, India.
[4]SVBPUA&T, Meerut, UP, India.

Authors' contributions

This work was carried out in collaboration among all authors. Authors RVS and RS designed the study. Author AC performed the statistical analysis, Authors AC and LKM wrote the protocol, and wrote the first draft of the manuscript. Author AC and Author LKM managed the analyses of the study. Authors AC and LKM managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Present study was conducted to analyse the cultural and pathogenic diversity in different isolates of *Bipolaris sorokiniana* the causal organism of spot blotch in bread wheat. Six isolates of *Biplorais sorokiniana* (BS-F-5, BS-D-2, BS-K,4, BS-DWR-K-1, BS-V-6, and BS-P-3) were evaluated simultaneously for cultural and pathogenic variability on the basis of diverse characteristics against seven different genotypes of wheat grown in the region viz: BOW'S', HS 375, HUW 234, PBW 343, PBW 443, K9107 and A9-30-1. The results indicated that isolates varied significantly among themselves for all the characters analysed. The isolate BS-F-5 exhibited the maximum colony diameter, maximum average dimension (length and width) of conidiophore, maximum number of septa in conidiophore and conidia. Variations were also observed in texture of the colony. Among the seven genotypes tested against six isolates, BOW'S' showed resistance against three isolates (BS-D-2, BS-K,4, BS-DWR-K-1) and genotype A-9-30-1 showed high susceptibility against all isolates except BS-D-2. The isolates BS-F-5 and BS-P-3 exhibited maximum pathogenic virulence among the isolates analysed in the present investigation.

**Corresponding author: E-mail: amitchauhanupcollege@gmail.com;*

Effect of temperature and pH on the growth of three isolates of *Rhizoctonia solani*

Alok Kumar Singh*
Jai P. Rai**

Introduction-

Rhizoctonia solani is capable of attacking a tremendous range of host plants including maize, rice, potato, soybean, sugarcane, sorghum, pea etc. Isolates may cause several types of diseases including aerial blight, leaf and sheath blight, damping-off, seed decay and root rot.

Rhizoctonia solani, perfect state in basidiomycotina as *Thanatephorus cucumeris* (Frank) Donk. It is a destructive plant pathogen with an almost unlimited host range. *R. solani* is both a pathogen and saprophyte, it is aggressively colonize organic debris and is one of the fastest growing fungi. The cells of *R. solani* are multinucleate and the cytoplasm is interconnected through septal pore (dolipore) i.e.characteristic of the basidiomycotina. No asexual spores are formed, only sclerotia formed as soil borne propagules. The sclerotia are knots of undifferentiated moniliod cells.

In the present investigation the three isolates of *R. solani viz.* maize, rice and soybean were studied for growth response to temperature and pH.

Materials and Methods-

The sclerotia of three isolates of *R. solani* were collected from maize field causing banded leaf and sheath blight, sheath blight on rice and aerial blight on soybean. The growth of all isolates of R.solani was studied on Potato Dextrose Agar (PDA) medium. Sclerotia obtained from the surface of the infected plant tissues were surface sterilized in aqueous mercuric chloride solution (0.1%) for one minute, washed in sterilized distilled water 3-4 times and transferred aseptically into Petri dishes seeded with PDA medium. After few days, mycelial growth developing at margin was transferred to PDA slants and incubates at $_{28 \pm 1\ ^{\circ}C}$.

The observations on the colony diameter and growth rate (mm/h) of three isolates of R. solani were determined at 5, 15, 25, 35 and 40 ±1 °C. Mycelial discs 6 mm in diameter were transferred from the margins of the 5 days-old colonies to the centre of each PDA plate. Each treatment was replicated four times. Observations on colony diameter were recorded at 24, 36, 48, and 60 hours after inoculations.

Growth rate and radial growth of three isolates of R. solani were studied at pH 2.0, 3.0, 4.0 5.0, 6.0, 7.0, 8.0 9.0, 10, 11 and12. The desired pH values of PDA medium were maintained by adding required amount of 0.1 N HCl or 0.1 N NaoH with help of digital pH meter. Six mm mycelia discs were transferred from margin of the 5-days-old colonies to the centre of each PDA plate. Each pH level was maintained in three replications. Observations on radial growth / diameter of the colony were recorded at 24, 48 and 72 hours after inoculations.

Results and Discussion

Effect of Temperature on Growth:-

The observation on the colony diameter and growth rate (mm/h) of three isolate of *R. solani* was determined at 5, 15, 25, 35 and 40°C and observations recorded at 24, 36, 48 and 60 hours of incubation. The Data on colony diameter and growth rate (mm/h) are presented in Table 1 and 2. respectively.

Colony Diameter: Average colony diameter at different time interval and temperature on PDA shown in Table 1. The data reveal that there was no growth at 5°C in all three isolates, till 60 hours of incubation. No growth of the soybean isolate was recorded at 15°C after 24 h of incubation, whereas 6.2 mm growth of maize isolate and 6.6 mm of rice isolate was recorded. The maximum colony diameter 56.7 mm after 60 hours of incubation was recorded in rice isolate followed by maize isolate (52.5 mm) and soybean isolate (43.0 mm).

***Deparatment of Plant Pathology, Faculty of Agriculture, Udai Pratap Autonomous College, Varanasi- 221002**
***Assistant Professor (Plant Protection), KVK, I. Ag. Sci. BHU, RGSC, Barkachha, Mirzapur- 231001**

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Short Communication

Genetic variability and correlation coefficient for horticultural traits in bottle gourd (*Lagenaria siceraria*)

Pradip Pandey[1*], Deepa Dewedi[1], Maneesh Pandey[2] and Kuldeep Singh[3]

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Bottle gourd belong to family Cucurbitaceae, which primarily comprised species consumed as food worldwide. Bottle gourd [*Lagenaria siceraria* (Mol.) Standl.] is important cucurbitaceous vegetable crop having chromosome number 2n=2x=22. is cultivated, both as rainy and summer season vegetable. The tender fruits of bottle gourd can be used as a culinary vegetable, *Kofta* or for making sweets *viz*. *Halva, Kheer, Petha*, *Burfi* and pickles. A decoction made from the leaf is a very good medicine for jaundice. Bottle gourd production is 2.68 MT from an area of 0.157 m/ha with 17.08 metric tons productivity and total vegetable production 184.39 MT from an area 10.259 MT with 17.97 metric tonnes productivity during 2017-2018 in India (NHB data 2018). The observed variability is a combined estimate of genetic and environment factors of which only former one is heritable. However, the estimate of heritability alone does not provide an idea about the expected gain in next generation, therefore it has been considered in conjunction with genetic advance, correlation and path analysis establish the extent association between yield and its components and bring out relative importance of their direct and indirect effects. This gives a clear understanding of their association with yield. Hence, the present study was carried out to assess the performance of economic traits and to measure the extent of variability, heritability, expected genetic advance and interrelationship of yield components in bottle gourd.

The experimental material for the present study was comprised of 16 genotypes of bottle gourd were collected from different parts of the India and grown at Vocational Floriculture Farm, Department of Horticulture, Babasaheb Bhimrao Ambedkar University, Vidya Vihar, Lucknow, UP (altitude 113 m ASL and 26.56 ÚN and 83.98 ÚE). The soil is sandy loam with pH 6.5. The experiment was laid out in RBD with three replications during November 2017 to April 2018. Bottle gourd seed were sown row to row 3.5 m and plant to plant 80 cm. The observations were recorded on five plants from each genotype in each replication mean of the data from the sampled plant of each plot in respect of different characters was used for various statistical analysis.

The analysis of variance indicated highly significant variation among the genotype for all the 15 characters. This variability may be due to genetic constitution of the materials as well as environmental influences. The estimates of mean, range, phenotypic coefficient of variance (PCV) and genotypic coefficient of variance (GCV), heritability (h^2) and genetic advance is presented in Table 1. Maximum mean value (54.70–71.77) was observed for days to first fruit harvest with an average of, days to first fruit harvest (60.06). The minimum range of mean value (0.60–0.73) with an average of 0.67cm was recorded in seed width. High magnitude of phenotypic coefficient of variance than the genotypic values indicated considerable influence of environment on the expression of the characters. The maximum phenotypic coefficient of variation (PCV) was observed for, No. of primary branches per plant, 100 seed weight, node at which first female flower appears while the lowest phenotypic coefficient of variation was observed for days to first male flower anthesis followed by seed width and days to first fruit harvest. Moderate phenotypic coefficient of variation was exhibited by fruit length, node at which first male flower appears, vine length the similar result has been reported by (Prasad and Prasad 1978a). Whereas, high genotypic coefficient of variation was observed for, yield per plant, vine length, fruit length, and also similar result have been reported by (Duhan et al. 2017). Whereas, high genotypic coefficient of variation observed in number of primary branches per plant, yield per plant, node at which first male flower appears. The lowest value of genotypic coefficient of

[1]Babasaheb Bhimrao Ambedkar University, Lucknow, UP
[2]RLBCAU, Jhansi, UP
[3]UP College, Varanasi, UP
*Corresponding author, Email: pradippandey2010@gmail.com

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IMPACT OF SYNTHETIC PESTICIDE ON AGRO-ECOSYSTEM IN INDIA: A COMPREHENSIVE REVIEW

Kamal Ravi Sharma[1], SVS Raju[1], Kuldeep Singh[2], S Ramesh Babu[1], Vinay N.[1], Basant Kumar Dadrwal[3] and Mohit Yadav[4]

[1]Department of Entomology and Agril. Zoology, BHU, Varanasi-221005, U.P., India, Email: ravikamal8075@gmail.com, [2]Department of Entomology, Udai Pratap Autonomous College, Mahatma Gandhi Kashi Vidyapith University, Varanasi - 221 003, Uttar Pradesh, India ,[3]Department of Plant Physiology, BHU, Varanasi-221005, U.P., India and [4]Department of Agronomy, CSAUAT, Kanpur- 208002, U.P. India, Corresponding Author: Kamal Ravi Sharma

Abstract: *In order to feed India's projected population of 1.40 billion in 2025, the use of pesticides is continuously increasing as it gives a quick result; also ensures crop quality and production. However, excessive use of pesticides may lead to the destruction of biodiversity. Its indiscriminate use resulted in an adverse effect on the soil fertility, quality of produce, crop productivity and caused adverse effects to bean aquatic and terrestrial ecosystem. Pesticides (Fungicides, herbicides, insecticides, etc.) are being used for the protection of plants from various types of pests and pathogens. It controls losses either inhibiting or killing the unwanted plants that cause harm to the crop. Generally, it is used for increasing crop yield, but it can induce biochemical changes in plants which may not be beneficial and also impose a severe negative impact on the environment. This paper reviews the effects of pesticides on the ecosystem, microbial populations, food, and vegetables as well as on beneficial insects and animals.*

Keywords*: Pesticides, Excessive use, Ecosystem, Adverse effect.*

Introduction: India is an agricultural country, and its economy mostly depends upon agriculture. After the green revolution in India, the use of pesticides has been tremendously increased to promote the production and productivity of the crop [1, 2, 3, 4]. In our country, Agriculture relies on chemicals to control weeds, pests, and diseases [5]. In modern agriculture, the output can be increased by applying pesticides, but their extensive use has surpassed their beneficial effects. There are several non-target plants and animals along with the targeted ones who are killed by the use of non-selective pesticides[6]. Moreover, some pests and pathogens also develop genetic resistance against these pesticides with time [7]. To control or eradicate a specific pest and pathogen of economically important crops [8], chemicals with a different mode of action are generally used [9]. They cause toxic effects on target organisms along with the non-target ones [10]. Pesticides cause the elimination of microbes essential for soil fertility [11]. Pesticides can leach down and contaminate the groundwater, which is the major concern with the use of pesticides [12].

The main goal of Agricultural practices is to protect the plant from harmful organisms. Organic manure is also effective [13]. But due to the quick response of pesticides, they are used on a large scale nowadays. They facilitate higher plant growth during the initial application [14] but due to their side effects on the soil microflora and non-target microorganism, it became a threat to sustainable agriculture. This review describes the hazardous effects of pesticides on the ecosystem, pest, and microbial populations and wildlife populations and species diversity, food, and vegetables as well as on beneficial insects and animals, etc [15].

Pesticides Scenario: Past to Present: The use of pesticides dates back to the times of Ancient Romans, where people used to burn sulfur for killing pests and used salts, ashes, and bitters for controlling weeds. In the 1600s, honey and arsenic mixture was used for controlling ants. In the late 1800s, chemicals like nicotine sulfate, calcium arsenate, and sulfur were used by

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Effect of Flavoures on Cultures, Sugar Levels and Storage Periods of Shrikhand

Shiv Sharan[1*], M. P. S. Yadav[1], Hari Shanker[1], S. K. Shahi[2] and Devendra Singh[3]

[1]Department of Animal Husbandry and Dairying, [3]Department of Entomology, C. S. Azad University of Agriculture and Technology, Knapur (U.P.), India
[2]Animal Husbandry and Dairying, U.P. College (Autonomous) Bhojubir, Varanasi (U.P.), India

**Corresponding author*

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A B S T R A C T

An experiment was conducted to investigate the effect of flavors on sensory quality of Shrikhand at Department of Animal Husbandry and Dairying of Chandra Shekhar Azad University of Agriculture and Technology, Kanpur (U.P.) India. The results of the present investigation showed that the flavour registered highest score (5.65) on milk sample of A_2 (*Lactococcus cremoris*) followed by A_3 (*Streptococus diacetilactis*) with score (5.45). The best flavour score (5.648) was noted in case of Shrikhand prepared with 40 % sugar (B_2) while, lowest score (5.24) in case of *45 %* sugar level (B_3). The highest score (5.638) obtained from mango flavour (C_3) followed by (5.45) orange flavour (C_2) While, the lowest flavour score (5.25) in no flavor added. It was observed that highest flavour score (7.80) was in fresh samples of *Lactococcus lactis* subsp. *cremoris* (A_2D_1); the next maximum flavour score (7.60) was in case of (A_3D_1), While minimum flavour score (3.40) was noted in (A_1D_4) samples. The maximum flavour score (5.84) was estimated in case of sample prepared with 40 % sugar level and mango flavour (B_2C_3) followed by (B_2C_2) and (B_1C_3), whereas the minimum score (5.05) was obtained from 45 % sugar level without flavouring agent (B_3C_1).

Introduction

Milk is an extremely complex biological fluid with sources of nutrients. These nutrients exist in milk in three physical phases: a dilute emulsion, a colloidal dispersion and a solution. The emulsion can be broken by low speed centrifugation and the milk separates into lipids and aqueous phases or compartments, each with a characteristic composition. Milk production in India during the year 2018-19 was 187.7 million tonnes. (Anonymous, 2019) which is likely to expand by 6.26 per cent. It is estimated that by 2020, milk production would reach a level of over 200 million tonnes.

Shrikhand name is derived from Sanskrit word "Shikhrani" meaning good nourishing food having high protein, fat and calorific

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Effect of Body and Texture on Cultures, Sugar Levels and Storage Periods of Shrikhand

Shiv Sharan[1*], M. P. S. Yadav[1], S. J. Singh[1], S. K. Shahi[2] and Devendra Singh[1]

[1]*Animal Husbandry and Dairying, C. S. Azad University of Agriculture and Technology, Knapur (U.P.), India*
[2]*Animal Husbandry and Dairying, U.P. College (Autonomous) Bhojubir, Varanasi (U.P.), India*

**Corresponding author*

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Body and texture, sugar, Culture, Storage periods, Flavor and *Latococcous crimoris*

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A B S T R A C T

An experiment was conducted to investigate the effect of body and texture on starter cultures, sugar levels and storage periods of Shrikhand at Department of Animal Husbandry and Dairying of Chandra Shekhar Azad University of Agriculture and Technology, Kanpur (U.P.) India. The results of the present investigation showed that the maximum score (8.00) was in case of fresh samples prepared from the combination of *Lactococcus lactice subsp. cremoris* with 40 % sugar level and mango flvour (A2B2C2D1) followed by the combination of A2B2C2D1, A2B1C3D1, A3B1C3D1, A2B2C1D1 and A1B2C3D1, respectively which were statistically at par with respect to body and texture score of shrikhand and were graded excellent quality and liked extremely. The lowest score (3.00) was registered from A1B3C1D4 samples and were graded as poor quality.

Introduction

Shrikhand is a popular Indian dessert prepared by the fermentation of buffalo milk. It has semi-soft consistency and has a sweet and sour taste. Typically shrikhand constitutes 39.0 percent moisture and 61.0 percent of total solids of which 10.0 percent is fat, 11.5 percent proteins 78.0 percent carbohydrates and 0.5 percent ash, on a dry matter basis. It has a pH range of about 4.2 to 4.4 (Boghra and Mathur, 2000B). On an industrial scale shrikhand is prepared by using different mechanical devices (Aneja *et al.,* 1977). In this process, pasteurized milk or skim milk is inoculated with the culture. Shrikhand prepared either from buffalo or cow's milk retained quantitatively all the constituents in proportion to the addition of sugar. Little or no change in pH was seen during the conversion of chakka into shrikhand. The mineral make-up remained more or less unchanged, except citrate which disappeared completely at dahi stage of both buffalo and

SHODH SAMAGAM

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Impact of Managemental Practices for Eastern Hariyana Cow in Eastern Zone of Uttar Pradesh

R.K. Pal, Department of Animal Husbandry & Dairying,
T.D. College, Jaunpur, Uttar Pradesh, INDIA
Shiv Bachan, Department of Animal Husbandry & Dairying
U.P. College, Varanasi, Uttar Pradesh, INDIA
K.B. Anand, Department of Agronomy
U.P. College, Varanasi, Uttar Pradesh, INDIA
Aditya Kumar, Department of Animal Husbandry & Dairying,
Janta College, Bakewar Etawah, Uttar Pradesh, INDIA

ORIGINAL ARTICLE

Corresponding Authors

R.K. Pal, Department of Animal Husbandry & Dairying,
T.D. College, Jaunpur, Uttar Pradesh, INDIA
Shiv Bachan, Department of Animal Husbandry & Dairying
U.P. College, Varanasi, Uttar Pradesh, INDIA
K.B.Anand, Department of Agronomy
U.P. College, Varanasi, Uttar Pradesh, INDIA
Aditya Kumar, Department of Animal Husbandry & Dairying,
Janta College, Bakewar Etawah, Uttar Pradesh, INDIA

shodhsamagam1@gmail.com

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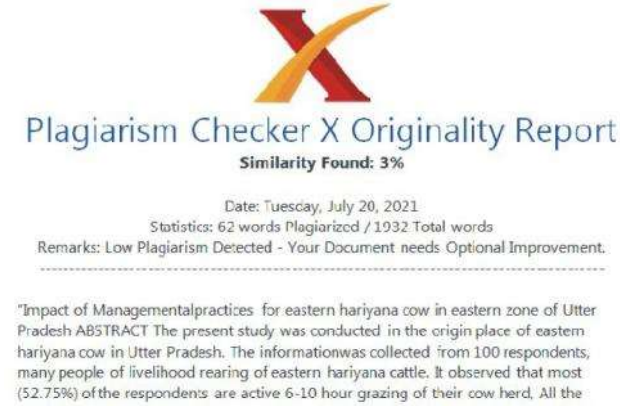
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"Impact of Managementalpractices for eastern hariyana cow in eastern zone of Utter Pradesh ABSTRACT The present study was conducted in the origin place of eastern hariyana cow in Utter Pradesh. The informationwas collected from 100 respondents, many people of livelihood rearing of eastern hariyana cattle. It observed that most (52.75%) of the respondents are active 6-10 hour grazing of their cow herd. All the

ABSTRACT

The present study was conducted in the origin place of eastern hariyana cow in Uttar Pradesh. The information was collected from 100 respondents, many people of livelihood rearing of eastern hariyana cattle.

It observed that most (52.75%) of the respondents are active 6-10 hour grazing of their cow herd. All the needed farmers were providing natural service to cow in the estrus period, maximum number of particular (57.50%) between 12-14 hours after detection of estrus and (52.75%) of them with sire available in cattle owner area and surrounding. Maximum number of respondents (35.20%) initially used indigenous knowledge for disease treatment and after that consult to veterinary doctor/stockman. Majar disease prevelant in the village include FMD, HS, BQ and Mastitis. Eastern hariyana cow were present to more resistance to the disease and heat tolerant as compared to cross bred and exotic breed of cattle. Majority of respondents (80.16%) are kept their cattle on kachcha floor in the good sanitary conditions. Account (70%) respondents made cattle shed, majority (58.98%) of the cattle owners were using hand method of milking. Grazing land and input for health management practices are needed to make the Eastern haryana cow husbandry is more lucrative. Use of AI Programme is more benificeried as compared to natural method.

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Genetic polymorphism in *MAP1B* gene associated with conception rate in Holstein Friesian crossbred breeding bulls

ARPAN UPADHYAY*, ATISH KUMAR CHAKRAVARTY, SHACHINANDAN DE, A SAKTHIVEL SELVAN, PUSHPRAJ SHIVAHRE, ASHOK KUMAR GUPTA and AVTAR SINGH

ICAR–National Dairy Research Institute, Karnal, Haryana 132 001 India

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The current cattle and buffalo breedable female population is 118.59 million in India (BAHS 2017), however, the country is producing around 85 million semen doses (NDDB 2017), which is sufficient to cover only around 42 million breedable female population (assuming the conception rate of 50% in cattle). To bring a large proportion of breedable female population under artificial insemination (AI) coverage, India needs to produce more number of breeding bulls. However, it is observed that many bulls after attaining the age of 2.5 to 3 years are culled in progeny testing programmes due to poor fertility (Panmei *et al*. 2016). This leads to the unavailability of the required number of bulls in the progeny testing programmes. It is desirable to select breeding bull based on fertility at a very young age to economize the breeding programme at any herd. Selection based on genetic information has made it possible to select animals at an early age. Male fertility is governed by genetic disposition of animals along with environmental factors. The microtubule associated protein 1 B (MAP1B) gene is one of the candidate genes which was found to be strongly associated with sire conception rate (Li *et al*. 2012). Bovine *MAP1B* gene is located on *Bos taurus* autosome 20 (Gene ID 514739), comprising 7 exons and 6 introns and conferring a total length of 93117 bp. Recent reports on the expression of MAP1B in the male reproductive tract in both rat and human (Queiróz *et al*. 2006) and in testis of fruit fly and mouse (Bonilla and Xu 2008) suggest important functions of this gene in the regulation of male fertility. The identification of polymorphism in the *MAP1B* gene will assist in the early evaluation of bulls based on fertility.

The present study was carried out on Karan Fries (KF) cattle kept under the progeny testing program at National Dairy Research Institute (NDRI), Karnal, Haryana, India. The KF is an *inter-se* mated crossbred population developed as a milch breed by crossing Holstein Friesian (*Bos taurus*) and Tharparkar (*Bos indicus*) cattle at NDRI farm. Cows were provided with *ad lib.* seasonal green fodder and roughages, and an additional amount of 1.0 concentrate mixture (20% CP and 3400 kcal/kg DE) for every 2.5 kg milk produced above 5.0 kg daily milk yield.

Genomic DNA was isolated from the frozen semen straws of 74 KF bulls. Three mini semen straws (0.25 ml) from each bull were used for DNA isolation and the protocol used for DNA isolation involved two steps: Lysis and extraction. The lysis of spermatozoa was done as per Hossain *et al*. (1997) with some modifications while the extraction step was done using a standard Phenol Chloroform extraction. The SNP, g.3,066A>G, located on intron 1of *MAP1B gene* (NCBI Reference Sequence: AC_000177.1) was genotyped using Tetra-Primer Amplification Refractory Mutation System Polymerase Chain Reaction (T-ARMS PCR) technique. Primers were designed using Primer 1 software. The sequence of the primers used in the present study was as follows: outer forward, 5'-AACTCTCTTGGGTCCTGGGGTC-3'; outer reverse, 5'-TGCTTCACACAACTGGTCCCAT-3'; inner forward, 5'-GATGCTTCCTCAGCTCTCCGA-3'; and inner reverse, 5'-AGGAGGCCCTGCTGGCAC -3'. The expected polymerase chain reaction (PCR) fragment size for g.3,066A>G mutation were 105 bp for A allele, 178 bp for G allele, and 249 bp for the common outer fragment.

The PCR was performed in a total volume of 25 µL containing approximately 100 ng DNA, 2.5 µL of 10× buffer, 2 mM of $MgCl_2$, 0.1 mM dNTPs, 10 pM of each of outer and inner pair of primer and 1 U of Taq Polymerase (Sigma-Aldrich, USA). The amplification conditions (Touchdown reactions) were: Initial denaturation at 95°C for 2 min, 5 cycles of denaturation at 95°C for 15 sec, with annealing temperature of 60°C for the first cycle, decreasing by 1°C per cycle until annealing temperature of 56°C was reached for 15 sec and extension at 72°C for 20 sec, followed by 25 cycles of denaturation at 95°C for 15 sec, with annealing temperature of 55°C for 15 sec and extension at 72°C for 20 sec, and final extension at 72°C for 5 min. The accuracy and efficiency of the T-ARMS PCR assay were evaluated by DNA sequencing (M/s First BASE Laboratories Sdn Bhd, Seri Kembangan, Selangor, Malaysia) of outer band product of three samples for each genotype.

*Corresponding author email: upadhyay.arpan@gmail.com

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Review Article

Role of Near Infrared Spectroscopy in Agriculture

Mamta Rathore[1]*, Shashi Bala[2] and H.G.Prakash[3]

[1]Department of Agriculture Biochemistry, C.S. Azad University of Agriculture &Technology, Kanpur, Utter Pradesh
[2]Department of horticulture2, U.P.P.G. College, Varanasi, Utter Pradesh
[3]Department of Dairy Science, C.S. Azad University of Agriculture &Technology, Kanpur, Utter Pradesh

Abstract

Farmers need non-destructive, accurate, rapid, and user-friendly tools to use on the farm to give them detailed information on the physical and chemical properties of crops at every stage of their growth. They also need to monitor the maturity and quality of their products. Quality control also continues beyond the farm and is necessary for the supply chain and retailing. Near infrared technology, which has been in use for the last four decades, is providing vital solutions in agriculture for these purposes. This is new technology which is very beneficial in the agriculture sectors and also the farmer.NIRS-2500,Near-infrared spectroscopy has been involved in the studied and applied in numerous applications across five key product areas such as fruits and vegetables, meats and fish, beverages and dairy, cereals and grain stocks, grapes, and olives but also areas regarding production factors which really effects i.e. soils and manures, and environmental applications. The mechanisms of near-infrared spectroscopy are well understood and the benefits are clear. NIR spectroscopy can give the fast, rapid, accurate, cost-effective results in the lab or in the field with little or no sample preparation and multiple parameters can measure with the same scan.

Keywords: NIRS-2500, absorption, transmission, fruits and vegetables, harvesting, field

***Correspondence**
Author: Mamta Rathore
Email: mamtacsa@gmail.com

Introduction

There is a modern technology in agriculture in which we analyzed the grain nutrition value which increases its effect to the human health. In the market the farmer gets more prices because they can justify its grain quality with the help of this technique. The chain of this analysis is to provide the superior quality nutritional crop which is noticed by this technique. It is a modern tool which works very efficiently to estimate such as in sea food, beverages, fruits, vegetables, meat and fish etc. There are soil and manure two important parameter which really effect their production [1, 2].

Effect of NIRS-2500 in Fruits and Vegetables

The preliminary steps for the application of this instrument are grading and sorting of the given sample which we desire to evaluate exceptionally apples, cherries, avocadoes, peaches and mangoes. This technique was helpful to measure the rapid, non-destructive measurement of several proteins, PH, carbohydrates, ash, fiber, chlorophyll a, chlorophyll b, ash, Vitamin-A and amino acids profile of essential amino acids. In recent time we really need a technology which rapidly and efficiently gives the authentic results which increase the R & D sector efficiency [3].

Effect of NIRS-2500 in Non Vegetarian products

This technique is enabling for the differentiation of proteins, fat, moisture, p^H of the meat. But it can able to recognize the volatile nitrogen content. Al l of the above is important characteristics in meat grading and quality parameter. To control the quality and packaging helps to prevent the common food borne disease [4].

Effect of NIRS-2500 in beverages and dairy products

Through this instrument we can similarly analyzed proximate composition of beverages and dairy products such as protein, fats, moisture, carbohydrate and minerals which are helpful parameter to detect the adulteration in these products. The shelf life depends upon residual moisture content and affects the profit market parameters [5].

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Research Article

Response of Integrated Nutrient Management on Vegetative and Flowering Characters of Marigold (*Tagetes erecta* L.)

Vikas Ranjan Chaudhary[1*], Shashi Bala[1], H. S. Shukla[1], I. P. Singh[2] and Dharmendra Yadava[1]

[1]Chandra Shakher Azad University of Agriculture and Technology, Kanpur, 20 8002

[2]K.V.K., Auraiya, U.P.

*Corresponding Author E-mail: rasinghcsau@gmail.com

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ABSTRACT

The present investigation was under taken on periodical observations (30, 60 and 90 DAT) on vegetative growth at C.S. Azad University of Agriculture and Technology, Kanpur. Results indicated that all the growth parameters such as number of leaves, plant spread, diameter of plant stem, increased to the maximum upto the 75 % nitrogen level with or without biofertilizers. As regard the flowering characters there was a significant reduction in days taken to first flower bud initiation and days taken to first flower bud opening, under the combined application of biofertilizers (Azotobacter + PSB) alongwith 75 % nitrogen (T_8) in both the years. While, Application of 100 % nitrogen alongwith biofertilizer inoculation delayed both the parameters. However, the maximum days were required under control (T_{14}).

Keywords: *Azotobacter, Biofertilizers, Marigold, PSB.*

INTRODUCTION

Marigold is native of Central and South America, especially Mexico (Randhawa & Mukhopadhyaya, 1986). Marigold is known as 'friendship flower' in United States and 'student lumen' (student's flower) in Germany. Marigold *(Tagetes erecta* L.), the most popular and commercial flower, apart from their aesthetic and industrial values, marigold is also got a wide range of application such as a trap crop and as a biopesticide in various horticultural and field crops. The main period for growing marigold in plains during winter season is from August to January. It is also grown in other seasons, like winter (November–April), summer (February-July) and rainy (May-October). As a result of continuous use of chemical fertilizers, the soil gets depleted year by year and there is pollution of soil and water bodies through leaching, volatilization, dentrification and fixation of phosphorous in soil. Nitrogen being highly mobile in soil can pollute soil and ground water, therefore, management of nitrogenous fertilizer such as rate, type of nitrogen fertilizer, application time is very important. Combination of *Azotobacter* + PSB + Phytoincremin with 75% N was found most effective in increasing the flower yield of marigold (Gupta et al., 1999).

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

Kamlesh K. Gautam and Shashi Bala

Assistant professor

Department of Botany and Department of Horticulture

Udai Pratap Autonomous College, Varanasi-221006

ABSTRACT

Mashroom 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.

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Influence of Panchagavya, Vermiwash and Organic Manure on Growth and Yield of Cauliflower (*Brassica oleracea* L. var. *botrytis*) cv. Pusa Snowball- 2

Ashok Pal and Shashi Bala*

Department of Horticulture, Udai Pratap College, Varanasi (U.P.), India

**Corresponding author*

Keywords

Panchagavya, Vermiwash, Organic manure (FYM), Cauliflower, Growth and Yield.

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A B S T R A C T

The present investigation was carried out during winter season of 2018-19 at Experimental Farm, Department of Horticulture, Udai Pratap Autonomous College, Varanasi (U.P.) in Randomized Block Design with three replications. Different combinations of Panchgavya, Vermiwash and organic manure (FYM) with control were used as treatment. Observations were recorded on vegetative, reproductive and yield related parameters. On the basis of recorded observations, it is found that the performance of the T_5 (100% NPK through FYM @ 20 t/ha + foliar spray of Panchagavya @ 4%) was better in all growth parameters such as plant height (19.49, 31.20 and 39.23 cm), number of leaves per plant (9.37, 15.87 and 19.75), leaf area (220.35, 358.52 and 518.25 cm^2), leaf length (12.50, 19.60 and 19.90 cm)and stem length (6.50, 8.89 and 10.78 cm), while the performance of T_6[100% NPK through Vermiwash (1:5 times dilution) + foliar spray of Panchagavya @ 4%] was found significant influence on Days of curd initiation (63.69 days) and Days of curd maturity (74.09 days) at 30, 45 and 60 DAT. The values for the characters Diameter of curd (12.07 cm), Weight of curd (737.78 g), Curd yield per plot (11.77 kg), Curd yield per hectare (273.57 q) showed highly significant performance with T_6 [100% NPK through Vermiwash (1:5 times dilution) + foliar spray of Panchagavya @ 4%]. The treatment T_5 (100% NPK through FYM @ 20 t/ha + foliar spray of Panchagavya @ 4%) performed as the best combination for growth and T_6 [100% NPK through Vermiwash (1:5 times dilution) + foliar spray of Panchagavya @ 4%] for reproductive and yield characters for commercial production of cauliflower.

Introduction

Cauliflower (*Brassica oleracea* L. var. *botrytis*) is an herbaceous annual or biennial vegetable of the family Crucifareae grown for edible tender curds and it is one of the popular vegetable crop around the world with respect to area, production and its availability. It has diploid chromosome number of 2n=2x=18. Cauliflower is primarily grown for consumption as a vegetable eaten after bowel or steaming or drying as pickling. India is a second leading cauliflower producing country after China. India rank second in area and production of cauliflower in the world after China. In India, Cauliflower is grown in an area of 0.453 million hectare with production of 8.668 million tonnes and productivity of 19.8 metric tonnes per hectare. In Uttar Pradesh, it is grown in an area of 14.39

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Effect of Different Mulches on Conservation of Soil Moisture, Growth, Yield and Quality of Tomato (*Solanum lycopersicum L.*) cv. Kashi Amrit

Dheeraj Maurya, Shashi Bala* and Ashok Pal

Department of Horticulture, Udai Pratap College, Varanasi (U.P.), India
**Corresponding author*

Keywords

Black polythene, Clear polythene, Mango leaves, Sugarcane leaves, Paddy straw, Wheat straw, Tomato, Growth Yield and Quality

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A B S T R A C T

The present investigation was carried out during winter season of 2018-19 at Experimental Farm, Department of Horticulture, Udai Pratap Autonomous College, Varanasi (U.P.) in Randomized Block Design with three replications. Different mulching material such as Black polythene, White polythene, Sugarcane leaves, Mango leaves, Paddy straw and Wheat straw with control were used as treatment. Observations were recorded on soil moisture, soil temperature, vegetative, reproductive, yield and quality related parameters. On the basis of recorded observations, it is found that the performance of the T_4 (Black polythene of 200 gauge) was better in soil moisture parameter 14.04%, soil temperature 22.85°C and also all growth parameters such as plant height (35.04, 68.35 and 79.97 cm), number of branches per plant (7.50), diameter of main stem (0.88, 1.85 and 1.88 cm) at 45, 60and 75 DAT, reproductive parameter such as number of flower per cluster (9.80, 9.70, 9.40), number of fruit per plant (6.60, 7.20 and 6.80), yield parameter viz. diameter of tomato (3.0 cm), weight of tomato (114.30g), yield of tomato kg / plot (17.20 kg) yield of tomato q / ha(353.90 q)and quality parameter such as total soluble solids(4.57 brix), ascorbic acid mg/100g fresh weight(33.40 mg) showed highly significant performance. The treatment T_4 (Black polythene of 200 gauge) performed as the best mulching material for growth, reproductive, yield and quality characters for commercial production of Tomato followed by T_2 (Clear polythene mulch50µ) is considered as the another best mulching material.

Introduction

Tomato (*Solanum lycopersicum,* L) belongs to the solanaceae family and chromosome no. is 2n= 2x=24.It is introduced in India by Portuguese and It is originated in Peru and Mexico, from where it spread to other parts of the world. It is considered as "poors man orange" in India while "Love of apple" in England. Tomato world's largest vegetable crop cultivated after potato and sweet potato and universally treated as a protective food 33%_of total growing area is covered by F1 hybrid which is highest among the vegetable grown in India.

Tomato crop is very important in terms of diet and economy both during the rainy season (rainfed) and dry season using irrigation facilities. It is grown as an off season vegetable in hills of India and farmers fetch good income after sending there produce in

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Manish Kumar Singh
Research Student, Department of Horticulture, Udai Pratap Collage, Varanasi, Uttar Pradesh, India

DK Singh
Associate Professor, Department of Horticulture, Udai Pratap Collage, Varanasi, Uttar Pradesh, India

Rohit Kumar Singh
Research Student, Department of Horticulture, I.Ag.S (BHU), Varanasi, Uttar Pradesh, India

Sudhir Kumar Mishra
Research Student, Department of Horticulture, National Post Graduate Collage, Barhalganj, Gorakhpur, Uttar Pradesh, India

Corresponding Author:
Manish Kumar Singh
Research Student, Department of Horticulture, Udai Pratap Collage, Varanasi, Uttar Pradesh, India

Integrated effect of biofertilizers and inorganic fertilizers on growth, yield and quality of onion (*Allium cepa* L.)

Manish Kumar Singh, DK Singh, Rohit Kumar Singh and Sudhir Kumar Mishra

Abstract
The research trial was conducted in the *Rabi* season of 2015 at Vegetable Research Farm, Department of Horticulture, Udai Pratap College, Varanasi. The experiment consisted of sixteen treatments *viz*. T1 - N + P + K (100% Recommended Full Does), T2 -75% N + P + K + 25% Azotobacter, T3 -50% N + P + K + 50% Azotobacter, T4 -25% N + P + K + 75% Azotobacter, T5 - N + 75% P + K + 25% PSB, T6 - N + 50% P + K + 50% PSB, T7 - N + 25% P + K + 75% PSB, T8 -75% N + 75% P + K + 25% , T9 - 50% N + 50% P + K + 50% Azotobacter + 50% PSB, T10 -25% N + 25% P + K + 75% Azotobacter + 75% PSB, T11 - 75% N + 50% P + K + 25% Azotobacter + 50% PSB, T12 -50% N + 75% P + K + 50% Azotobacter + 25% PSB, T13 - 25% N + 50% P + K + 75% Azotobacter + 50% PSB, T14 -25% N + P + K + 75% Azotobacter + 25% PSB, T15 - 75% N + 25% P + K + 25% Azotobacter + 75% PSB and T16 - 50% N + 25% P + K + 50% Azotobacter + 25% PSB Azotobacter + 25% PSB which was carried out in randomized block design (RBD) with three replications. The result recorded the significantly higher bulb yield of 303 q/ha with the application of 50:45:100 kg NPK/ha and inoculation of field with 1.25 ± 0.62 kg/ha Azotobacter and PSB.

Keywords: biofertilizers, inorganic fertilizers, yield, quality of onion

Introduction
Onion (*Allium cepa* L.) is one of the most important commercial crops among vegetable, spice and condiments in India. It is an important bulb crop cultivated all over the world on commercial scale both for local consumption and export. It was cultivated in more than 175 countries, on nearly 3 million ha, producing more than 50 million tonnes. India is the second largest producer after China in India producing 20333 MT, an area 1178 million ha and productivity 16.3 MT/ha (NHB Database, 2014-15). Gujarat, Madhya Pradesh, Orissa, Rajasthan Tamilnadu Bihar and Maharashtra, it is state cover of maximum area and production of onion in India. Maharashtra is largest producer of onion in the country with is about 30 lakh MT production from 1.03million ha which is about 25 per cent to the production and 20 per cent to the total area the onion production depend mainly on area cultural practices like nutrition irrigation plant protection measure beside the congenial climatic factors. It is especially rich in protein, carbohydrate and ascorbic acid. About 38 kcal. Calories of energy is obtained from 100g onion. Nutritive value of onion (nutritive value per100 g onion scales) water (89 g) lipids (0.16 g)carbohydrate (8.6 g) fibre (1.8 g) potassium (157 mg) sulphur (70 mg)phosphorus (33gm) calcium (20gm) vitamin C (6.4 gm.) vitamin E (0.26 gm.) vitamin B6 (0.116gm.) folic acid (19mcg.) glutamic acid (0.118g) argentine (0.156g) lysine (0.055g) leucine (0.041g). Biofertilizer have recently gained with momentum for effecting the sustainable increase the crop yield under various agro climate condition role of bio-fertilizer on the crop growth. It is using bio-fertilizer with adding mineral and organic matter led to improve of vegetative growth yield and quality of plant. Mixture of FYM and Neem cake increase the yield of onion and enriched nutrient content of bulb of onion. Thus there is ample scope for increasing production through fertilizer especially, that organic manure and bio-fertilizer in light texture soil. The microorganism involved in P solubilising can enhance plant growth by increasing the efficiency of biological nitrogen fixation, enhancing the availability of other trace element and by production of plant growth promoting substances. Bio–NP fertilizer gave significant increment in yield component of sesame plant Bio-NP ensure better nitrogen consumption. Which is essential to plant growth the Azospirillum bacteria and

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SSR marker based differentiation of zygotic and nucellar seedlings in mango (*Mangifera indica*)

KAMLESH KUMAR[1], MANISH SRIVASTAV[2*], SANJAY KUMAR SINGH[3] and ANKIT SINGH[4]

ICAR-Indian Agricultural Research Institute, New Delhi 110 012 , India

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ABSTRACT

Non-availability of standard clonal rootstocks in mango (*Mangifera indica* L.) is considered as an important hurdle, which has significant impact on orchard productivity. To obtain grafted mango plants, it is important to use polyembryonic rootstocks since they produce a zygotic and several nucellar plantlets from their seed, which are true-to-the type and also uniform. It is therefore imperative to device some reliable approach to ascertain the nucellar origin of seedlings to be used as rootstocks and thus culling out the variable zygotic seedlings in a polyembryonic genotypes for their use as uniform clonal rootstock. Differentiation of zygotic and nucellar seedlings using SSR markers in mango rootstock genotypes was undertaken during 2012-2015. Of the 42 SSRs used, 9 primer pairs (LMMA1, LMMA2, LMMA8, LMMA15, ESTD1, ESTD2, ESTD6, ESTD9 and ESTD10) were found to be informative, while 33 primer pairs were monomorphic. These nine primer pairs were used for differentiating zygotic and nucellar seedlings. In Olour rootstock, LMMA1, LMMA2, LMMA8, ESTD6 and ESTD10 primer pairs were informative and ascertained the zygotic and nucellar origin of seedlings. In Kurukkan rootstock, ESTD1, ESTD2, ESTD6 and ESTD9 primer pairs differentiated zygotic from nucellar seedlings. In 13-1 rootstock, LMMA8, LMMA15 and ESTD9 discriminated nucellars from zygotic seedlings. It is concluded that SSR markers were useful in differentiating the zygotic and nucellar seedlings in polyembryonic mango rootstocks and can be used in combinations to ascertain the origin of seedlings in polyembryonic mango rootstocks.

Key words: Mango, Nucellar, Polyembryony, SSR markers, Zygotic

Mango (*Mangifera indica* L.) cultivation in the country is hampered due to number of factors, *viz*. mango malformation disease, alternate bearing habit, physiological disorders, erratic bearing under climate change *etc*. However, non-availability of standard rootstocks in mango is considered as an important problem, which has significant impact on overall orchard productivity. Mango can be propagated by seeds or by grafting. For commercial purpose, grafting is the most appropriate method because it maintains the genetic uniformity of the propagated genotype. Several fruit species including mango has polyembryonic genotypes. Those mango varieties which are of Indian origin are chiefly monoembryonic. Many mango varieties of Indo-Chinese origin have polyembryonic seeds. To obtain grafted mango plants, it is important to use polyembryonic rootstocks since they produce a zygotic and several nucellar seedlings from single seed (Sturrock 1968). Polyembryony is characterized by the development of more than one embryo in the same seed, in which one zygotic and remaining are nucellar in origin. The nucellar plantlets maintain the genetics of the mother-plant and supposedly give more uniformity to the orchard and are preferred for grafting. In general, nurserymen use the most vigorous plantlets for grafting, believing that they are nucellar. However, orchard dis-uniformities in terms of canopy and yield is very common among mango trees in commercial orchards. It is therefore imperative to device some reliable tool to ascertain the nucellar origin of seedlings to be used as rootstocks and culling out zygotic counterparts in a polyembryonic genotypes for their use as rootstock. If a rootstock has more than 80% polyembryony, the possibility of obtaining nucellar plants increases and making it possible to have a uniform rootstock (Soares Filho *et al.* 2003; Santos *et al.* 2010).

Various methods have been attempted to discriminate the zygotic seedlings from nucellar's such as rootstock colour test (Furr and Reece 1946), flow cytometry (Tusa *et al.* 2002), thin layer chromatography (Tatum and Berry 1974), gas chromatography (Weinbaum *et al.* 1982), morphological

Present address: [1]Scientist (kamlesh9520@gmail.com), ICAR- Central Institute of Arid Horticulture, Bikaner, Rajasthan; [2]*Principal Scientist and corresponding author (msrivastav@iari.res.in), ICAR- Indian Agricultural Research Institute, New Delhi; [3] Head & Principal Scientist (sanjydr2@gmail.com), Division of Fruits and Horticultural Technology, ICAR- Indian Agricultural Research Institute, New Delhi; [4] Assistant Professor (ankitp13on@gmail.com), Udai Pratap College, Varanasi, Uttar Pradesh.

Development of Prediction models for Bond Strength of Steel Fiber Reinforced Concrete by Computational Machine Learning

Priyanka Singh[1], *Chakshu* Garg[2], *Aman* Namdeo[1], *Krishna* Mohan Agarwal[3], *and Rajesh* Kumar Rai[4]

[1]Department of Civil Engineering, Amity School of Engineering & Technology, Amity University Uttar Pradesh, Noida, India
[2]Department of Computer Science & Engineering, Amity School of Engineering & Technology, Amity University Uttar Pradesh, Noida, India
[3]Department of Mechanical Engineering, Amity School of Engineering & Technology, Amity University Uttar Pradesh, Noida, India
[4]Department of Agricultural Engineering, Udai Pratap College, Varanasi, Uttar Pradesh-221 002, India

Abstract. Sustainable construction contributed to the usage of recycled and waste materials to substitute conventional concrete. This research focuses on prediction of normalized bond strength of cement concrete substituted by large amounts of waste materials and products with strong mechanical properties and sustainability. It also emphases on using analytical model for the prediction of bond strength of the green concrete, so that there is a reduction in the cost of construction, con-serve energy, and it will lead to a reduction of CO2 production from cement industries within reliable limits. In this paper machine learning approach has been used to predict the normalized bond strength of green and sustainable concrete. Machine learning empowers machines to learn from their experiences and data provided. The system analyses the datasets and finds different patterns formed in the given data. Then, based on its learnings the machine can make certain predictions. In civil engineering application, a special computing technique called the Machine learning (ML) is in huge demand. ANN is a soft computing technique that learns from previous situations and adapts without constraints to a new environment. In this work, a ML network model for prediction of normalized bond strength of concrete has been illustrated. Different sets of data based upon several concrete design mixes were taken from technical literature and were fed to the model. The model is then trained for prediction, which are being influenced by several input attributes and were jotted down a linear regression analysis.

1 Introduction

Machine learning is an area of study which helps computers or systems to learn from their experiences and improve. Arthur Samuel defines machine learning as "the field of study that gives computers the ability to learn without being explicitly programmed". This definition given by Arthur Samuel is not a very formal definition of machine learning [1,3]. Therefore a relatively newdefinition is given by Tom Mitchell, it says, "A computer program is said to learn from experience E with respect to some class of task T, and a performance measure P, if its performance at tasks in T, as measured by P, improves with experience E". For example, two digits are paired, the user inputs one digit to expect the other digit from the machine. The machine then has to identify the logic between the pairs and give the other value as a prediction to the user [4, 7]. This process of finding or evaluating the logic, and learning from experiences is what machine learning is all about.

Machine learning is a technology that emphasises on learning from data. The system analyses the datasets and finds different patterns formed in the given data. Then, based on its learnings the machine can make certain predictions [8].

There are many different approaches that can be used for machine learning. The approaches commonly used in machine learning are supervised learning, semi-supervised learning, unsupervised learning and reinforcement learning. In this work data has been collected experimentally and has been analysed in order to apply the machine learning techniques. The data comprises of both the input features and the output features. Therefore, supervised learning became handy.

2 Experimental Setup

The dataset obtained was not in the desired form so as to apply different machine learning algorithms. So proper data preprocessing was performed. Initially the dataset was normalised, thereafter outliers were removed and missing data was handled. After all the cleaning and pre- processing was done the dataset contained 361 instances. This cleaned and pre-processed dataset was then used to apply machine learning algorithms so

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Fostering Indian Economy through Technology Business Incubator and Startup: A Conceptual Study

Sushil Kumar
Assistant Professor, Department of Financial Studies, V.B.S. Purvanchal University, Jaunpur
Dr. Banarasi Mishra
Associate Professor, Faculty of Commerce, Udai Pratap (Autonomous) College, Varanasi

Abstract

Technology business incubators is now considered as a prevailing tool for economic development. As compared to the other developed country, India stands on 6th ranking in terms of Gross Domestic Product (GDP) in 2021. The sector wise movement in GDP of India from 1950 to 2014 depicts there is a massive increase in service sector and in contrast a great collapse in manufacturing sector. Comparing with neighbor countries like China, the rate of increase in GDP is much higher. One of the major reasons behind it that China puts more focus on economic activities be it manufacturing activities or servicing activities. In India, there has not been much focus on economic activities. So, in order to propel economic activities, there is very much needed to adopt and establish Technology Business Incubator (TBI) and Science and Technology Entrepreneurs Park (STEP). These institutions support startups. The present paper strives to give a conceptual framework of TBI and startup will attempt to put focus on the functioning of TBIs offered to startup in India as well as how TBI will escalate economic activities.

Keywords: Technology Business Incubator, Startups Ecosystem, Technology Transfer, Business Idea.

Introduction

A Technology Business Incubator (TBI) is a non-profit organization as well as an intermediary that incubates an innovative business idea primarily involving use of technology. It facilitates innovative business idea to turn it into startup initially and eventually a successful big concern. It is just like a process where a hen hatches her eggs till the poult comes out. Similarly, till the innovative business idea turns to be a successful venture, TBI incubates it. Often it takes 2-3 years and sometimes it goes 5 years. During incubation, TBI offers variety of services which are highly essential for a startup. The greater number of startups will lead to the more economic activities. The startup must have a new idea associated with technology having growth potential. According to the report of National Science and Technology Entrepreneurship Development Board (NSTEDB), a business incubator is a temporary facilitator to startup to provide varied services through which the startup can explore a new market or capture the existing market wholly or partly through its products and services. The services which a new startup can't afford, the business incubator provides the same after having found a sound idea. This is the one side of TBI. The other side of TBI is that it promotes young, talented and dynamic personality and motivate them to establish their career in the field of entrepreneurship. It's not necessary that entrepreneurs are always born rather the entrepreneurs are made also. Only the things which is required that providing a platform on which they can prove their ability, stuff and caliber and contribute towards the overall development country in general and their personality as an entrepreneur in particular.

NSTEDB in its report highlighted two main reasons through which TBI came into existence:

1. An increasing interest at alarming rate in fostering unique business idea, especially in small enterprises as an economic development strategy.
2. The aspiration to develop high-tech based venture in the period when globalization demands it.

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Digital Entrepreneurship: Opportunities and Ecosystem

Dr. Banarasi Mishra[1], Dr. Ajay Dwivedi[2], Ravindra Singh[3]
[1.] Associate Professor, Department of Commerce, U P College, Varanasi, Uttar Pradesh, India.
[2.] Professor, Department of Financial Studies, Veer Bahadur Singh Purvanchal University Jaunpur, Uttar Pradesh, India.
[3.] Assistant professor, Ramjas College, University of Delhi, India.

Abstract

There has been rapid growth in the study of digital entrepreneurship in past decade as it has become part of our day-to-day life. The objective of this study is found opportunities that digital technologies provide to the entrepreneurs with its challenges and impact of government programs to develop better ecosystem to promote digital business. After reviewing various articles and analyzing secondary data from different sources it is found that use of digital technologies creates huge opportunities specially in the field of product/services innovation and cost-effective process management with challenges mainly due to less digital penetration in rural economy. It is suggested that government and industry should focus on developing digital infrastructure and improve digital inclusion which will help in exploring new market for entrepreneurs.

Introduction

Schumpeter (Theory of economic development, 1911) put great emphasis on entrepreneurship for economic development as they are the one who applies their innovative skills to bring change in the economy by introducing new product, new method of production, alternative source of resources, identifying new market, introducing new/restructuring organization. In entrepreneurial context, importance of innovation can be observed from survival and growth to even satisfying different stakeholders of business, and from opportunities identification to commercialization and feedback of product (Tidd and Bessant, 2015).

In 21st century, emergence and rapid growth of digital technologies have revolutionized the mode of innovation and the face of business worldwide (Global Entrepreneurship Monitor, GEM). Companies around the world are embracing digital technologies as they have the power to expand businesses beyond global boundaries by gaining a competitive edge in the global marketplace. Like big and established organizations, small and new entrepreneurs are also investing in digital technologies to not only improve the top line by seizing substantial new business growth opportunities, but also to make their business processes more efficient by saving time and energy and reducing operating costs. It goes a long way in reducing the transaction costs of a firm and its entry costs, and mitigating the disadvantages that young and small firms experience in comparison with large, existing firms that benefit from economies of scale. Use of digital technologies also helps new entrepreneurs to serve its innovative customers well and create niche markets. The intersection of digital technologies and entrepreneurship[1] (popularly termed as *'Digital Entrepreneurship'*) provides global springboard for entrepreneurs with innovative products and services to access new markets, cross border financing, global ecosystem. Global expansion helps digital entrepreneurs not only to garner greater revenue but also to create more employment opportunities. As a result, every young entrepreneur is now a digital entrepreneur, to a large extent.

Digital technologies offer huge opportunities but are also fraught with challenges, leading to possible failures. Shortage of skilled manpower, scarcity of finance, difficulty to keep pace with the changing technology, lack of appropriate business model, impractical strategies, poor data security and privacy, e-payment readiness, lack of trust, poor digital infrastructure, consumer skepticism and archaic legal framework are some of the prominent reasons of failure of digital entrepreneurship model. Thus, digital entrepreneurship offers huge opportunities for those who are

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Green Marketing as the Source of the Competitive Advantage of the Business

Dr. Rajeev Krishna Singh
Associate Professor, Faculty of Commerce, U.P. Autonomous College, Varanasi
Manoj Kumar Upadhyay
Research Scholar, Faculty of Commerce, U.P. Autonomous College, Varanasi

Abstract

In this work we zeroed in on summing up the standards of green promoting and the ideas connected with it. The point of this commitment was to demonstrate the connection between the execution of green advertising standards and manageable serious organization position available. To demonstrate the connection between the execution of green showcasing standards and the serious market position of organizations, we utilized a numerous relapse strategy to uncover the relationship, notwithstanding numerous factors. This was gone before by an element examination that assisted us with choosing the primary variables of impact. To meet this objective, we have drawn from the reviews directed by PwC India, the Vehicle Business Affiliation and the Indian Car Foundation to distinguish key variables and future expected improvement in the car business provider fragment and our promoting research, led from November 2018 to February 2019. In light of the aftereffects of promoting overviews, research reactions and the investigation of accessible assets, we inferred that there is no extensive green advertising execution model connecting natural buyer conduct with a connection to the organization's showcasing technique. The commitment could help the Auto Business Association to introduce necessities to the public authority and assist with making impetuses for the elective vehicle market, and our discoveries could be consolidated into the production of organizations' technique.

Keywords: Green promoting; feasible upper hand; corporate social obligation.

1. Introduction

The current time frame is described by the horrendous misuse of regular assets, shaky financial turn of events and, specifically, environmental change. This is an express that shows changes in buyer conduct changing the reactions of business elements. This is the specialty of advertising [1]. Overviews show that six out of 10 endeavors would put resources into economical drives regardless of whether there were to be an underlying expansion in costs. A few organizations have in practically no time embraced the Natural Administration Framework (EMS) and have started to apply an eco-accommodating way to deal with every corporate action. Numerous organizations have started to take feasible drives to adopt on a mutually advantageous strategy that saves money on the expenses of the undertaking while at the same time showing mindfulness among clients who are progressively searching for guarantees from dependable organizations since they know that ecological subjects influence movements of every kind connecting with human life [2]. Incorporating the principles of green marketing into business systems is increasingly being mentioned in the globalization process of the economy, given the enormous potential in obtaining a viable competitive advantage [3].

Of corporate social obligation, which has been and is the principle point examined at a few yearly gatherings of the World Monetary Discussion. Natural exercises in the structure of big business methodology advancement give the European Association a Green Paper in which CSR characterizes the willful joining of social and ecological viewpoints into everyday business exercises and cooperations with (partners). Under this idea, organizations intentionally choose to add to a superior society and a cleaner climate [5]. This definition depends on supposed the rule of triple-primary concern (individuals, benefit, planet), that is, the estimation of positive and adverse consequences of the venture on the social, financial and ecological

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Green Marketing and its Impact on Supply Chain Management in Industrial Markets

Manoj Kumar Upadhyay
Research Scholar, Faculty of Commerce, U.P. Autonomous College, Varanasi
Dr. R.K. Singh
Associate Professor, Faculty of Commerce, U.P. Autonomous College, Varanasi

Abstract

Green showcasing and green store network have been drawing the consideration of the two scholastics and experts in the new decade. In any case, no comprehensive system has been created on the best way to assemble green modern brands and mechanical corporate brands. Regardless of whether maintainable/green inventory chains can be incorporated with green modern advertising in building greener associations and mechanical brands is as yet muddled. Also, little is known on the elements on green new mechanical item improvement or how green new industrial products are adopted by organizations. Furthermore, we know little of whether and how green supply chain enables green new industrial product development. This special issue aims at reflecting the most recent advances on green industrial marketing, green/sustainable supply chains and their interplay in green industrial branding, and to explore future research directions. The guest editors hope that the solicited papers can provide insights on the impacts of sustainable or green supply chains on marketing theory in industrial and business-to-business markets.

Introduction

Green marking and supportability have pulled in much consideration from both the specialists and scholastics from various business disciplines, for example, showcasing, production network the executives, and data the board.),no holistic framework exists on how to build green industrial brands and industrial corporate brands. Building strong green industrial brands requires not only green marketing, but also green operations and green supply chain management. In addition, globalization and inter- national sourcing exert extra pressure and challenges on designing and implementing a truly green and sustainable supply chain from the global perspective.

From operations and supply chain side, for example, the reduction of waste (such as operations efficiency, delivery and distribution net- work), which is the core principle of lean operations, could be considered as a form of sustainability. Advances in data innovation can likewise assist with diminishing waste (for example papers and energy) somewhat. Various different devices, for example, life cycle appraisal, eco-plan for support to-support item improvement, and so on, are accessible. Be that as it may, they are, including lean way of thinking, generally not connected to mechanical showcasing. From promoting point of view, for instance, albeit green shoppers and utilization have gotten some consideration, little is known on the elements on green B2B showcasing and green authoritative buy conduct. Better understanding on how and why associations pick green providers has significant suggestions for green B2B promoting.

In this publication, we first survey some key written works identifying with green showcasing methodology, green store network the executives, and the job of innovation of in green administration. We at that point present the articles showing up in this extraordinary issue.

Green marketing strategy

Green marketing and management is a strategic issue (Siegel, 2009), not only because being green makes a firm "good", but also because being green pays (Ambec & Lanoie, 2008;

R.K. Singh

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The Concept of Green Marketing and Green Product Development on Consumer Buying Approach

Manoj Kumar Upadhyay
Research Scholar, Faculty of Commerce, U.P. Autonomous College, Varanasi
Dr. R.K. Singh
Associate Professor, Faculty of Commerce, U.P. Autonomous College, Varanasi

Abstract

As the ecological issues are getting worse, the consumers' concerns about the environmental protection have led to the diversification in consumer buying approach towards a green lifestyle. Therefore, firms are taking action to develop potential ecological approaches in the green market industry. Green marketing and green product development are useful techniques that are used by firms to increase competitive advantages and stand a chance of gaining the satisfaction of consumers in order to achieve the firm's mission and vision. Green marketing and green product development have various benefits to firms in terms of increasing the sustainable environmental benefits and to increase the awareness of brand image of the firm. This study focuses on the concept of green marketing and green product development, the different consumer consumption in regards to green marketing and green product development, and lastly examines the problems that firms have faced when they have failed to implement green marketing and green product development.

Keywords: Green promoting, green item improvement, utilization, ecological advantages.

1. Introduction

According to Yakup and Sevil (2011), from the beginning of the 1980s, there have been ecological issues such as global warming, the greenhouse effect, pollution, and climate changes which are directly related to industrial manufacturing and this will continue to affect human's activities. Due to the increase of environmentalism which has dominated the world, there has been a raise in consumer concern with regards to environmental protection and great demand for green products. Hence, most firms have begun to use the green marketing and green product development strategies that can preserve the environment while satisfying consumers' preferences in order to make long term profits in businesses. Before such ideas came in to use, many firms were using green marketing as a sub form of their marketing structure as well as trying to develop green products that could help with the growing environmental problems. There are organizations implementing strategies which aim to solve ecological issues and build up the long term interest toward consumers. The advantages of green marketing and green product development, the relationship between green marketing and green product development towards the consumers buying approach and the problems are included in this research paper.

2. Green Marketing

Different authors provided different meaning of green marketing. According to Chaudhary, Tripathi, and Monga (2011) the term of "green marketing" first revealed in the late 1970s. American Marketing Association (AMA) defined it as "ecological marketing". Green marketing consists of a wide range of business activities which intends to satisfy customers' needs and wants, as well as diminish the negative impacts on the natural environment (Tiwari, Tripathi, Srivastava, & Yadav, 2011). Green marketing also refers to an organization that puts its efforts in to promoting, pricing, and distributing products with eco-concerns (Sarkar, 2012). American Marketing Association (AMA) stated that the green marketing approach is the marketing of products that are mainly focused on environmental safety; it incorporates business activities which consist of packaging modification, production process, and green advertising

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Public Investment and Growth of Agriculture Sector: A Comparative Study of Uttar Pradesh and Uttarakhand

BANSH GOPAL YADAVA
Research Scholar
Department of Economics, University of Allahabad, Allahabad (U.P.) India

ABSTRACT

Agriculture is not only a core sector of the Indian economy but also of state level especially Uttar Pradesh economy too. Majority of economies in the world are either developing or underdeveloped nations. But these economies have low productivity in agriculture for want of sufficient production technology and capital formation despite of poor resources and low capital investment capacity of farmers. Capital is the most vital input required for achieving the much desired goal of growth. It is one of the most crucial factors, which sets the pace and pattern of economic growth in any economy. Same role can play in agriculture sector in any economy too. The study area of this paper is Uttar Pradesh and Uttrakhand. There are two objectives of the study-First, to compare the growth of agriculture sector of selected state and second, to give the suggestion for developing the growth of agriculture sector for both selected states. On the base of overall analysis and hypothesis testing, it can be said that public investment has a positive relationship with agriculture growth in both states. But, Utilization of public expenditure is less meaningful in Uttarakhand than Uttar Pradesh because Uttarakhand is a new state compare than Uttar Pradesh and it has more hilly areas than Uttar Pradesh. It needs more management in Agriculture sector. Therefore, PPP model should be applied to develop agriculture sector in Uttarakhand. The Green Revolution had highly benefitted the farming system of the plain area of the Uttarakhand State while it has neglected the hilly region.

Key Words : Public investment, Agriculture sector, Productivity, Efficiency

INTRODUCTION

About agriculture sector:

Agriculture is not only a core sector of the Indian economy but also of Uttar Pradesh and Uttarakhand economy too. It is prime pulse of Industrial sector. It has demand as inputs as well as for consumption. This sector also provides employment. An average Indian still spends almost half of his/her total investment on food, while roughly half of India's work force is still engaged in agriculture for its livelihood or about two-thirds of the population is dependent on the sector. Growth of other sectors and overall economy hinges on the performance of agriculture to a considerable extent through its backward and forward linkages. It is not only a source of livelihood and food security for a large population of India but also has a special significance for low income, poor and vulnerable sections.

Majority of economies in the world are either developing or underdeveloped nations. But these economies have low productivity in agriculture for want of sufficient production technology and capital formation despite of poor resources and low capital investment capacity of farmers. Capital formation is the outcome of investment. As a matter of fact, investment refers to the flow of expenditure diverted to increase or maintain capital stock. Agricultural investment refers to changes in the level of all inputs that augment physical capital, enhance agricultural production capacity and the conservation of natural resources, knowledge and human capital development, rural infrastructure net-work and post-production equipment. Capital is the most vital input

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ग्रामीण विकास एवं अवस्थापनात्मक तत्व : एक भौगोलिक अध्ययन

डॉ0 अंजू सिंह
एसोसिएट प्रोफेसर, उदय प्रताप स्वायत्तशासी कॉलेज, वाराणसी

सारांश

भारतीय आर्थिक विकास का मूल आधार ग्रामीण क्षेत्रों का विकास है। इन क्षेत्रों में उन संपूर्ण परिस्थितियों का निर्माण करना होगा, जो संपूर्ण अर्थव्यवस्था समृद्धि में सहायक हो एवं गांव की उन्नति के साथ समूचे राष्ट्र के विकास को संभव बना सके। किसी क्षेत्र के अवस्थापनात्मक तत्वों की अवस्थित, वितरण, विशेषताएं एवं परिमाण क्षेत्र की विशेष अर्थव्यवस्था को निर्धारित करते हैं। क्षेत्र में स्थित उर्वरक बीज गोदाम की संख्या एवं क्षमता कृषि विकास को नवीन आयाम प्रदान करते हैं।

भूमिका

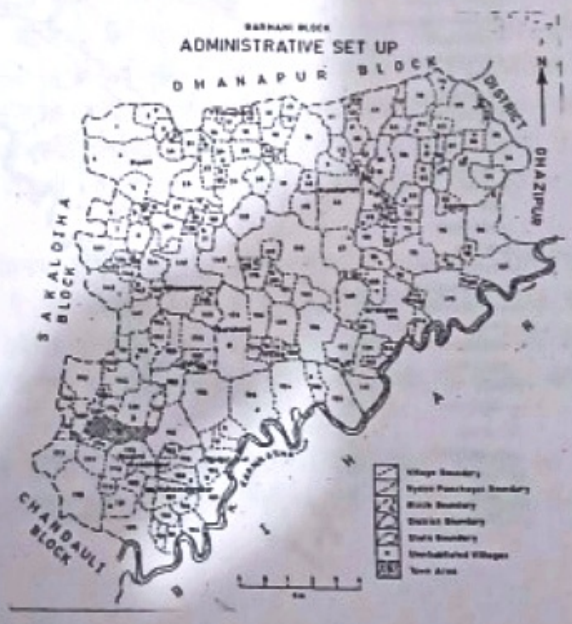
ग्रामीण विकास से अभिप्राय है, ग्रामीण क्षेत्रों में रहने वाले अनेकानेक निम्न वर्ग के लोगों के जीवन स्तर में सुधार लाना है। किसी भी क्षेत्र में अवस्थापनात्मक तत्व ऐसे भौतिक तत्व होते हैं, जो सामाजिक–आर्थिक विकास प्रक्रिया को संचालित करते हैं। ग्रामीण क्षेत्र का सामाजिक आर्थिक विकास और क्षेत्र के संरचनात्मक परिवर्तन में निर्भर होता है। विकास में तीव्र गति से प्रगति हेतु ग्रामीण क्षेत्रों के विभिन्न सामाजिक एवं आर्थिक अवस्थापनात्मक तत्व के विकेंद्रीकरण करने से होता है, क्योंकि इसके माध्यम से ग्रामीण विकास की प्रक्रिया को निश्चित दिशा मिलती है। अवस्थापनात्मक तत्वों के अंतर्गत शैक्षिक संस्थाएं, बैंक, विपणन, सहकारी समितियां, परिवहन की सुविधाएं एवं प्रशासनिक तंत्र आते हैं।

आंकड़ों का संग्रहण

अध्ययन क्षेत्र में अवस्थापनात्मक तत्वों का विकास खंड स्तर पर विश्लेषण करने हेतु आंकड़ों का संग्रह सांख्यिकीय पत्रिका चंदौली जनपद से किया गया है।

अध्ययन क्षेत्र

चन्दौली जनपद (उ.प्र.) के चन्दौली तहसील में स्थिति बरहनी एक विकासशील विकासखण्ड है। यह वाराणसी नगर से सुदुर पूर्व में लगभग 43 कि.मी. दूरस्थ है। इसका अंक्षाशीय विस्तार 25°23 उ. से 25°11 30 उत्तरी से 25°23 उत्तरी एवं देशान्तरीय विस्तार 83°11 40 पूर्वी से 83°33 5 पूर्वी है। तदनुसार यहाँ का कुल क्षेत्रफल 271.70 कि.मी. एवं जनसंख्या 125,068 (वर्ष 1991)है। यह विकासखण्ड उत्तर में धानापुर पश्चिम में सकलडीहा दक्षिण एवं दक्षिण–पश्चिम में चन्दौली विकासखण्ड, दक्षिण एवं दक्षिण–पूर्व में बिहार राज्य तथा उत्तर–पूर्व में गाजीपुर जनपद से आवृत्त है। प्रशासनिक दृष्टिकोण से यह 12 न्यायपंचायतों 65 ग्राम सभाओं एवं 199 ग्रामों (जिसमें 56 नाचिरागी ग्राम भी सम्मिलित हैं) में विभक्त हैं। विकासखण्ड मुख्यालय सैयदराजा में स्थित है।



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Sex Ratio in Punjab: A Geographical Study

Anju Singh, (Ph.D.), Department of Geography,
Udai Pratap Autonomous College, Varanasi, Uttar Pradesh, INDIA

ORIGINAL ARTICLE

Corresponding Author
Anju Singh, (Ph.D.),
Department of Geography,
Udai Pratap Autonomous College,
Varanasi, Uttar Pradesh, INDIA

shodhsamagam1@gmail.com

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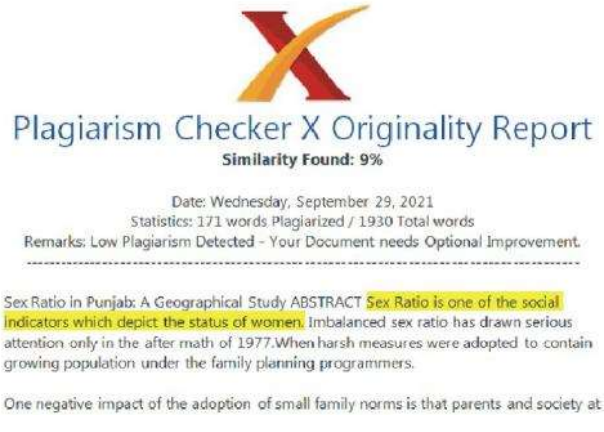
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Sex Ratio in Punjab: A Geographical Study ABSTRACT Sex Ratio is one of the social indicators which depict the status of women. Imbalanced sex ratio has drawn serious attention only in the after math of 1977.When harsh measures were adopted to contain growing population under the family planning programmers.

One negative impact of the adoption of small family norms is that parents and society at

ABSTRACT

Sex Ratio is one of the social indicators which depict the status of women. Imbalanced sex ratio has drawn serious attention only in the after math of 1977.When harsh measures were adopted to contain growing population under the family planning programmers. One negative impact of the adoption of small family norms is that parents and society at large preferred male child. The task of the parents has been made easy by the new innovations in determining the sex of the fetus. This has replaced to a large extent infanticide with feoticide. The 2011 census reveals that the general sex ratio in India is stable during last 15 years which was 941 in 1961 and 940 in 2011.Government is taking many initiative in many states like in Punjab, Haryana and Delhi to improve this decline in sex ratio.

Present study is an attempt to examine the level and trends in the sex ratio in Punjab which has observed consistently low sex ratio over a century. The situation has worsened because of steep fail in CSR in the last census decade. The study also tried to reveal spatial variations, a various levels like district Sex ratio is one of the good indicator or a way to know the women status in the society and even socio-economic conditions of a region. If sex ratio of an area is understood then we can easily plan and comprehend demographic dynamism in terms of mortality, migration, economic characteristics, marital status etc.

KEYWORDS

Sex Ratio, Gender Discrimination, Female Feoticide, Population.

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Difference Type Estimator in Finite Population Sample Surveys

Narendra Kumar
Department of Statistics, Udai Pratap Autonomous College, Varanasi

Abstract

This paper suggests two parameter family of difference type estimator of the population mean in a finite population sample survey with SRSWOR design. Using some prior information, the optimum mean square error (MSE) of this estimator has been compared with the existing estimators.

1. Introduction

Consider a finite population $U=(U_1, U_2, \ldots .U_N)$ of size N. Let Y be the study variate taking the value y_i for the unit U_i, i=1, 2,..... N; the mean of which is to be estimated.

The population mean $\overline{Y} = \left(N^{-1}\sum_{i=1}^{N} y_i \right)$ can be estimated unbiasedly by the usual sample mean $\overline{y} = \left(n^{-1}\sum_{i=1}^{n} y_i \right)$ of a sample of size n taken randomly from the population preferably using without replacement scheme.

When a suitable auxiliary information is available on a supplementary variate X, taking the value x_i of the unit U_i, i=1, 2,..., N, which is highly correlated with the study variate Y. It is possible to improve upon the usual unbiased estimator of the population mean by using this auxiliary information.

We use the ratio estimator or product estimator according to the relationship between auxiliary variate X and study variate Y. If the correlation between auxiliary and study variates is highly positive or highly negative the ratio or the product estimator Goodman (1960) respectively is used.

Infact for the better utilization of auxiliary variate Murthy (1964) has compared the relative precision and suggested the use of

Ratio estimator $\bar{y}_R = \frac{\bar{y}}{\bar{x}}\bar{X}$ if $\rho\frac{C_y}{C_x} > \frac{1}{2}$ (1.1)

Product estimator $\bar{y}_p = \frac{\bar{y}}{\bar{X}}\bar{x}$ if $\rho\frac{C_y}{C_x} < -\frac{1}{2}$ (1.2)

and usual unbiased estimator

$$\overline{y} = \left(\frac{1}{n}\sum_{i}^{n} y_i \right) \quad \text{if} \quad -\frac{1}{2} < \rho\frac{C_y}{C_x} < \frac{1}{2} \tag{1.3}$$

It is found that ratio estimator or product estimator provides an estimator of the population mean if the regression of Y on X is linear passing through the origin. It is seen that the ratio and product estimator depend on $\overline{y}$ and $\bar{x}$, and their efficiencies also depend on the efficiencies of $\overline{y}$ and $\bar{x}$ both.

Later on, using some constant Searls (1964) has proposed an estimator $\bar{y}_k$, which is an improvement over usual unbiased estimator $\overline{y}$ for optimum value of constant. Similarly using auxiliary information with some constants Srivastava (1967), Reddy (1973), Ray and Sahai

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A Family of Estimators of Population Mean in Presence of Non-Response on Study Variate

Dr. Narendra Kumar
Department of Statistics, Udai Pratap Autonomous College, Varanasi

Abstract

This paper suggests a family of estimators like difference estimator of population mean $\bar{Y}$ in presence of non-response. The optimum mean squar error (MSE) of proposed estimator has been compared with existing estimators using some prior information.

1. Introducaton :

For finite population U_i ; i=1,2,....N of size N, Y_i and X_i ; i=1,2,....N, are values of study and auxiliary variate respectively for i^{th} unit of population. Clearly population mean $\bar{Y} = \left(N^{-1}\sum_{i=1}^{N} y_i\right)$ of study variate can be estimated unbiasedly by sample mean $\bar{y} = \left(n^{-1}\sum_{i} y_i\right)$

When auxiliary information available on X Variate which in highlg correlated with study variate Y, rato and product estimetors are used. Lui (1990) proposed a general family of modified product estimator $\frac{\Lambda}{Y_P}_{(k_1', k_2')} = \frac{(k_1'\bar{x}+k_2')\bar{y}}{\bar{X}}$ k_1' & k_2' *are constants.*

When regression of Y on X is linear, a class of estimators is defined as-

$$\frac{\Lambda}{Y} = \bar{y} + h(\bar{X} - \bar{x}) \qquad \ldots\ldots(1.1)$$

However it is very common experience that data cannot be collected always from all units of the sample specially when study variate Y is income, expenditure etc. Some of the respondents may refuse to give information regarding study variate and so the sample of returns is incomplete. This incompleteness of sample returns in termed as non-response. Hansen and Hurwitz (1946) have suggested an estimator $\bar{y}*$, considering the sub-samle of size m selected randomly from non-responding units n_2 of sample, $n_2 = n - n_1$, n_1 are the responding units of n units of sample.

$$\bar{y}^* = w_1 \bar{y}_1 + W_2 \bar{y}_m, \qquad (1.2)$$

Where $w_1 = n_1/n$ and $w_2 = n_2/n$; $\bar{y}_1$ and $\bar{y}_m$ are means of sample based on n_1 and m units respeclively. Also

$$\text{var}(\bar{y}^*) = \frac{(1-f)}{n} S_y^2 + \frac{(k-1)}{n} W_2 S_{y(2)}^2 \qquad (1.3)$$

Where $f = n/N$; $k = n_2/m$; $W_2 = N_2/N$

and $S_{y(2)}^2 = \frac{1}{(N_2-1)}\sum_{i=1}^{N_2}(y_i - \bar{y}_2)^2$; $\bar{y}_2 = \frac{1}{N_2}\sum_{i=1}^{N_2} y_i$

where N_2 is number of units in non-responding group of population, $N_2 = N - N_1$, N_1 is number of units in responding group of population.

2. Proposed Ertimator :

In sample surveys, situation may arise in which non-response present only in y variate but not is x variate and so sample mean $\bar{x}$ can be obtained from sample.

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Relabelling Procedure for Controlled Sampling in Finite Population Sample Surveys

Dr. Narendra Kumar
Department of Statistics, Udai Pratap Autonomous College, Varanasi

Summary

In finite population sample surveys, the controlled sampling was used by the Kumar (1994) for reducing the probability of selection of non-preferred samples in case of variance estimation under unbiased regression estimation. The present paper suggests a relabelling procedure for further reduction in the probability of selection of non-preferred samples.

1. Introducton :

The controlled samplig designs was originated by Goodman and Kish (1950). The controlled sampling method reduces the probability of selection of undesirable samples while retaining properties associated with a probability sampling design. Combinatorial properties of experimental designs in controlled sampling dosigns was used by chakrabarti (1963), Avadhani and Sukhatme (1973), Nigam et al. (1984), Gupta et al. (2012) etc. The application of linear and non-linear programming in controlled sampling was used by Rao and Nigam (1990), Tiwari et al. (2007), Mandal et al. (2011) etc. Kumar (1994) extended the idea of controlled sampling using balanced incomplete block design (BIBD), under which regression estimator t_s of population mean $\bar{Y}_N$ remains unbiased as under sampling scheme proposed by Singh and Srivastava (1980). Where $t_s = \bar{y}_s + \frac{s_{xy}}{s_x^2}(\bar{X}_N - \bar{x}_s)$, for sample $s \in S$.

An unbiased variance estimator of t_s is then proposed by Kumar (1994) which takes negative values less often than that of variance estimator of Singh and Srivastava (1980). The value of P_α is computed by summing the selection probabilities of all the non-preferred samples s^* for which variance estimator takes negative values. The non-preferred samples were identified in the presence of knowledge of Y_i for all units in the population. This is just for the demonstration of the superiority of controlled sampling over the uncontrolled sampling for regression estimator. But this situation, when all Y-values in the population are known, is not found in practice. In the present paper, therefore, a different procedure of identification of non-preferred samples is suggested.

2. The Proposed Procedure

The variance estimator,

$$\text{est var}(t_s) = t_s^2 - \frac{1}{nN}\frac{S_x^2}{s_x^2}\left\{\sum_{i\in s} y_i^2 + \frac{N-1}{n-1}\sum_{\substack{i\neq j \\ i,j\in s}} y_i y_j\right\} \qquad (2.0)$$

takes a non-negative value when

$$(2.1) \qquad t_s^2 \geq \frac{1}{nN}\frac{S_x^2}{s_x^2}\left\{\sum_{i\in s} y_i^2 + \frac{N-1}{n-1}\sum_{\substack{i\neq j \\ i,j\in s}} y_i y_j\right\},$$

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Two Variate Ratio Estimator under PPAS

Narendra Kumar
Department of Statistics, Udai Pratap Autonomous College, Varanasi

Abstract

Midzuno (1952) proposed an unequal probability sampling in which the probability of selection of sample s is proportional to sum of sizes. Lahiri (1951) suggested a method of sample selection for which the ratio estimator using auxiliary variate X is unbiased. We extend the idea contained in Lahiri (1951) to the case where two auxiliary variates are available which are highly positively correlated with the study variate. We proposed an unequal probability sampling scheme under which a ratio estimator using two auxiliary variates X_1 and X_2 is unbiased. The variance of this estimator under the proposed scheme is derived.

Introduction

In sample survey, the use of an auxiliary variate X, Which is highly correlated with study variate Y, is advantageous in terms of defining some efficient estimators, including ratio and regression estimators, than to the estimators based only on the sample observations on study variate Y as in the case of simple random sampling (SRS).

As an extension to this concept, we can say that in situations where more than one auxiliary variates are available, it will be, obviously, more advantageous to include the observations on all the auxiliary variates for defining estimators of population parameter, i.e., population mean $\bar{Y}_N$ and population total Y of study variate. Olkin (1958) has proposed a multivariate ratio estimator using the information on p auxiliary variates $X_1, X_2, X_3, \ldots, X_p$, under SRS. But the estimator proposed by Olkin (1958) is a biased estimator under SRS. The magnitude of bias may be substantial, specially for small n.

The ratio estimator is unbiased under probability proportional to aggregate size (PPAS) scheme due to Hajek (1949), Lahiri (1951) and Midzuno (1952). Extending the ideas contained in Lahiri(1951), we propose a sampling with varying probabilities of selection of samples in contrast to SRS with equal selection probability to different samples of sample space. A ratio estimator is then proposed using two auxiliary variates X_1 and X_2 under this sampling scheme. This estimator is shown unbiased under the proposed sampling scheme. Also the expression of variance of the proposed estimator is derived under proposed sampling scheme.

2. The proposed Unequal probability Scheme :

Consider two auxiliary variates X_1 and X_2 which are highly positively correlated with study variate Y. Let $Y_1, Y_2 \ldots, Y_N$, $X_{11}, X_{12}, \ldots, X_{1N}$, and $X_{21}, X_{22}, \ldots, X_{2N}$, are the values of study variate, first and second auxiliary variate respectively, for N units of the population.

Let

$$P_i = \frac{\omega_1 X_{1i} X_2 + \omega_2 X_{2i} X_1}{X_1 X_2} \qquad \ldots(2.1)$$

where $X_1 = \sum_{i=1}^{N} X_{1i}$ and $X_2 = \sum_{i=1}^{N} X_{2i}$

$\omega_1 + \omega_2 = 1$ *and* P_i *denotes the initial selection probability of* i^{th} *unit of populaton,* $i = 1, 2, \ldots N$. *The weights* ω_1 *and* ω_2 *are to be chosen such that* $P_i > 0$ *for all* $i = 1, 2, \ldots N$

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A NEW ASYMMETRIC LOSS FUNCTION FOR ESTIMATION OF ANY PARAMETER

Dinesh Kumar, Pawan Kumar*, Pradip Kumar, Umesh Singh and Prashant Kumar Chaurasia

Department of Statistics, Banaras Hindu University, Varanasi - 221 005, India.
E-mail : pawanchauhanstrangr@gmail.com

Abstract: A new asymmetric loss function which is suitable for estimation of location as well as scale and other parameters has been introduced. To check the superiority of the proposed loss function over some existing and exploited loss functions such as squared error loss function (SELF), general entropy loss function (GELF), LINEX loss function and Logarithmic-SELF (LSELF), we have calculated the Bayes estimators of the parameter θ of exponential distribution under SELF, GELF, LINEX loss function, Logarithmic- SELF (LSELF) and the proposed exponential squared error loss function (ESELF) for complete sample from the exponential distribution. A data set has been considered to show its application to the real problems. The simulation study is carried out to compare the performance of Bayes estimators in terms of their posterior risks.

Key words: Exponential distribution, Bayes estimator, Loss function, Simulation study, Posterior risks.

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1. Introduction

An important element in Bayesian method of estimation is the specification of suitable loss function. Initially, the loss functions were motivated from mathematical case and their robustness to the problems under consideration. From the above point of view, Legendre (1805), have introduced SELF as $L_S(\hat{\theta},\theta)=(\hat{\theta}-\theta)^2$, which is suitable for estimation of location parameter θ, because justified measure of error for location parameter θ is $\hat{\theta}-\theta$. If correct decision is achieved, loss incurred is zero. It also equally penalized over estimation and under estimation of the same magnitudes. But in the real situations it is rarely obtained. To overcome this difficulty Klebnov (1972) developed LINEX loss function and latter used by Varian (1975), and is defined as $L_L(\hat{\theta},\theta)=e^{c(\hat{\theta}-\theta)} -c(\hat{\theta}-\theta) -1$, where $c\neq 0$ is the loss parameter. If $c>0$, then over estimation is more serious than the under estimation of the same magnitude and vice-versa. On the other hand, if $\hat{\theta}$ be the estimate of the scale parameter θ, then the suitable measure of error for scale parameter θ is $\frac{\hat{\theta}}{\theta}$ and accordingly various authors have defined a number of loss functions, which are suitable for the estimation of scale parameter θ such as modified LINEX loss function, entropy loss function, General entropy loss function and many more.

Here, we are proposing a loss function called exponential squared error loss function (ESELF) after motivated by Kumar *et al.* (2019), which is suitable for any kind of parameter and has the following form

$$L_{ES}(\hat{\theta},\theta)=(e^{-\hat{\theta}}-e^{-\theta})^2 \qquad (1)$$

The plot of the loss function $L_{ES}(\hat{\theta},\theta)$ against $e^{-\hat{\theta}}-e^{-\theta}=\Delta$ is shown in Fig. 1 for θ = 1.5

The Bayes risk associated with the above proposed

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A New Transmuted Lifetime Distribution: Statistical Properties and Application to Survival Data

Abhimanyu Singh Yadav[1], Dinesh Kumar[1], Pawan Kumar[1*], S. K. Singh[1] and Umesh Singh[1]

[1]Department of Statistics, Banaras Hindu University, Varanasi, Uttar Pradesh-221005.
asybhu10@gmail.com, dinesh.ra77@gmail.com, pawanchauhanstranger@gmail.com, singhsk64@gmail.com, usingh_52@yahoo.co.in

Abstract: **In statistical literature, several methods are available to generate a new probability distribution by introducing new parameter to any existing standard distribution. The quadratic rank transmutation map method is one of these and received considerable attention in the literature. Here, we also proposed a new probability distribution using this method when DUSE(θ)-distribution is chosen as baseline distribution. The proposed distribution is called transmuted DUSE(θ)-distribution, which is seems to be more flexible as compared to the baseline distribution. Different statistical properties such as moments, quantile function, survival function, hazard function and order statistics have been derived. Also, the method of maximum likelihood and method of maximum product spacing are used to estimate the unknown parameters of the introduced probability distribution. Simulation study is being carried out to know the long-run behavior of the distribution. Finally, a real data set has been utilized to show the applicability of the proposed distribution.**

Index Terms: **Maximum Likelihood Estimator, Maximum Product Spacing Estimator, QRTM, DUS-transformation, DUSE(θ)-distribution.**

I. INTRODUCTION

In statistical literature, a large number of distributions are available to analyze the characteristics of the lifetime data. The application of statistics particularly that of statistical modeling in our day to day life, is so vast that there is merely any field where statistics can't be used. To predict some future event with higher accuracy, the statistician must have to care regarding selection of model, which may achieve in term of flexibility and or parsimony of the selected models.

In survival analysis, a number of models are available in literature to study the characteristics associated with the lifetime data. Initially, exponential distribution was extensively used due to its memory less property and analytical tractability. Although the use of one-parameter exponential distribution has been restricted due to its constant failure rate and seems to be inappropriate in real-life situations where associated hazard rate is not constant. To accommodate the situation of non-constant hazard rate, researchers attempted, again and again, to develop new lifetime distributions so that these become more flexible to analyze such type of failure rate behavior. In this context, gamma and Weibull distribution have been introduced and found more suitable for the data having monotone hazard rate, e.g. See (Mudholkar et al. (1993), Gupta et al. (1998), Nadarajh et al.(2011) etc), unimodal and bathtub shape of hazard rate of TGIED discussed by Okorie, I. E., & Akpanta, A. C. (2019). But, both of these models are applicable only for monotone failure rate and found less advantageous for those real life data which shows the behavior of non-monotone failure rate. In order to get much flexible distribution, several generalization techniques has been introduced. To incorporate such flexibility in the model, several generalizations or a new class of distributions based on specified baseline distributions have been proposed in the literature. Recently, Kumar et al. (2015), advocated to transform any available baseline distribution, so that the new distribution thus obtained is parsimonious in parameters as the transformation do not incorporate any additional parameter, rather it adds flexibility in terms of wide variety of hazard rate function. They have introduced DUS transformation to obtain a new distribution.

If $H(x)$ be the cdf of a baseline distribution, then DUS transformation that provides cdf of a new distribution, say $F(x)$ as given below:

$$F(x) = \frac{e^{H(x)}-1}{e-1} \qquad \dots \quad (1)$$

Shaw and Buckley (2007) introduced $QRTM$ to generalize any available distribution. It provides cdf $G(x)$ of a new distribution as follows,

$$G(x) = (1 + \lambda)F(x) - \lambda(F(x))^2 \quad ; \ |\lambda| < 1 \ \dots \quad (2)$$

Here, we have considered $QRTM$ to get a new lifetime distribution and the considered baseline distribution is

टूटती, बिखरती लोकसंस्कृति को बचाने की गहरी छटपटाहट

डॉ. गोरखनाथ *

प्रस्तावना – समकालीन हिन्दी कथालेखन आज पर्याप्त प्रौढ़, समर्थ एवं विकसित हो चुका है। इसका विस्तार जीवन के विभिन्न आयामों को पूरी संवेदनशीलता, ईमानदारी तथा रचनात्मकता के साथ समेटता है। इस समकालीन कथालेखन की सबसे प्रमुख धारा प्रगतिशील एवं जनसरोकारों से अत्यधिक गहराई से जुड़े कथाकारों की है, जिनमें मिथिलेश्वर का नाम विशेष महत्वपूर्ण है। वे आज हिन्दी के सुपरिचित एवं लोकप्रिय कथाकार हैं। इनके कथालेखन की शुरूआत विशेष रूप से 70 के बाद से होती है और लगातार क्रियाशील रहते हुए आज अत्यधिक परिपक्व एवं अनुभव सम्पन्न दौर में पहुंच चुकी है। मिथिलेश्वर जी ने अपनी रचनात्मक क्षमता, प्रगतिशील विचारधारा एवं लोकसंवेदना की छाप अपने कथालेखन में बखूबी छोड़ा है। उनके अब तक लिखे गए उपन्यास एवं कहानियाँ इसके प्रमाण हैं। अपने इस कथालेखन के माध्यम से निश्चिय ही उन्होंने हिन्दी कथालेखन को एक नई परिभाषा दिया है और हिन्दी की प्रगतिशील एवं जनवादी परंपरा को बड़ी ही मजबूती से आगे बढ़ाया है। इस रूप में मिथिलेश्वर जी निरंतर सृजनशील रचनाकार की छवि बनाते हैं। 2008 में प्रकाशित उनकी कथात्मक उपलब्धि 'भोजपुरी लोककथा' हिन्दी कथालेखन में एक नया आयाम खोलती है। इसमें मिथिलेश्वर जी ने 51 भोजपुरी लोककथाओं की पुनर्रचना किया है, जो उनके खतरे उठाने के साहस, गहरी लोकसंवेदना और कथारचना की विशिष्ट क्षमता का साक्ष्य है। भोजपुरी लोककथाओं की यह पुर्नरचना वास्तव में एक प्रकार की मौलिक रचना ही है। इसीलिए कथाकार को रचनात्मक प्रीतिकर अनुभूति प्रदान करती है– 'जब पुर्नरचना के रूप में इक्यावन लोककथाओं का यह संग्रह तैयार हुआ तो मैंने वैसी ही सृजनात्मक खुशी महसूस की, जैसी खुशी अपने बड़े उपन्यासों की रचना के बाद की थी।'

भोजपुरी लोककथाओं के इस संकलन को देखने से पता चलता है कि इन लोककथाओं में भोजपुरी लोकजीवन और लोकसंस्कृति की धड़कने अत्यन्त गहराई और स्पष्टता से सुनी जा सकती हैं। इन लोककथाओं में भोजपुरी जनता की हजार वर्षों में बनने एवं विकसित होने वाली अनुभव, चिंतन एवं संघर्ष की परम्परा आकार ग्रहण करती हुई दिखाई देती है। प्राय: इन लोककथाओं का स्वरूप उपदेशात्मक मिलता है। हर एक लोककथा जीवन के लिए किसी न किसी जरूरी संदेश से युक्त है। लोकजीवन की एक लम्बी विकासमान परम्परा में निर्मित ये लोककथाएँ उसके लिए एक कर्मठ, ईमानदार और साहसी जीवन जीने का संदेश लेकर आती है। इस रूप में ये लोककथाएँ अनुभवसिद्ध एवं व्यावहारिक ज्ञान का अक्षय भंडार कही जा सकती हैं। आज के बाजारवादी, उपभोक्तावादी, अपसंस्कृति के व्यापक फैलाव के दौर में लोककथाओं के इस अनुभवसिद्ध एवं व्यावहारिक ज्ञान राशि का भोजपुरी सहित समस्त भारतीय जनता के बीच प्रचार–प्रसार लेखक की आकांक्षा एवं प्रमुख प्रेरणा रही है। अपने समय के इस विसंगतिपूर्ण वातावरण में लोककथाओं की अनिवार्यता का अनुभव वास्तव में लेखक की प्रतिरोधी सांस्कृतिक चेतना का गहरा साक्ष्य है। इस सन्दर्भ में मिथिलेश्वर जी ने लिखा है– 'इन (संचार) माध्यमों के संचालकों एवं संयोजकों ने मनोरंजन के नाम पर लोगों की मानसिकता को किस कदर विकृत, संवेदनहीन और भोगवादी बनाना शुरू कर दिया है, उसकी भयावह परिणतियाँ आए दिन देखने को मिलने लगी हैं, जबकि लोककथाओं का मनोरंजन मानवता के बुनियादी पाठ के साथ व्यावहारिक ज्ञान का सशक्त माध्यम भी है।'

इस तरह मिथिलेश्वर जी द्वारा भोजपुरी लोककथाओं की यह पुनर्रचना उनके व्यापक जनसरोकार और गहरी सांस्कृतिक चिन्ता से जुड़ी हुई है। इन लोककथाओं का एक आकर्षक पक्ष यह भी है कि इनमें ज्ञान, उपदेश एवं संदेश कोरे और ऊपर से लादे हुए न होकर लोक जीवन के स्पन्दनों, रागों एवं अनुभवों से पूरी तरह संसिक्त हैं। इसीलिए अत्यन्त सहजता एवं रचनात्मकता के साथ ये लोककथाएँ अपने मन्तव्य को पाठक तक पहुंचाने में सफल होती हैं।

सामान्यत: इन लोककथाओं की अन्तर्वस्तु निषेधवाची एवं विधेयवाची दोनों ही कोटि की है। अर्थात् कुछ लोककथाएँ मानवीय दुर्बलताओं, विकृतियों एवं असामाजिक प्रवृत्तियों को विषयवस्तु बनाती हैं और इनसे बचने का संदेश देती हैं। इसी तरह अनेक लोककथाएँ जीवन की अच्छाइयों एवं स्वीकारात्मक पहलुओं को आधार बनाती हैं और जनजीवन में इनकी स्वीकृति एवं व्यापक प्रचार–प्रसार की अनिवार्यता बताती हैं। इस सन्दर्भ में हम देखते हैं कि सामाजिक जीवन में प्राप्त होने वाली स्वार्थपरता, चालाकी, बेईमानी, विश्वासघात जैसी दुष्प्रवृन्ति:यों को 'ऊँट, फूट और सियार', 'कौआ हंकनी' तथा 'चिट्ठी' आदि लोककथाएँ आधार बनाती हैं और इस बात पर बल देती हैं कि इन प्रवृत्तियों का परिणाम सदैव विनाशक होता है। 'गड़ेरिया, सियार और बाघ' लोककथा का आशय है कि धूर्तता का दण्ड भुगतना ही पड़ता है। इसी तरह 'दोस्ती का दंभ' में अहंकार का परिणाम विनाशक होता है। 'सियार और सारस' में स्वभावगत दुष्टता नहीं छूटती, 'चापलूस दरबारी' में चापलूसी अच्छी आदत नहीं होती तथा 'अन्धेरपुर नगरी' में मूर्ख व्यक्ति अपना विनाश स्वयं करता है, जैसे सामान्यत: मनुष्य के लिए जरूरी एवं उपयोगी संदेश दिए गए हैं।

हमारे समाज में लालच को बुरी बला कहा गया है। 'मणिवाला सांप', 'बंदर और मगरमच्छ', 'सुकन गदहा' जैसी लोककथाएँ इसी भावना का संचार करती हैं कि अधिक लालच का नतीजा सदैव बुरा ही होता है। 'कौआ और बटेर' लोककथा इस भावना का भी संदेश देती है कि लालची एवं दूसरों

* एसोसिएट प्रोफेसर (हिन्दी) उदय प्रताप कॉलेज, वाराणसी (उ.प्र.) भारत

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Cost Effective Techniques for Enhancing Hybrid Rice Seed Production

Pragya Parmita
Associate Professor, Department of Genetics and Plant Breeding, Udai Pratap Autonomous College, Varanasi

Abstract

Rice (Oryza sativa L.) is one of the most important staple cereal crops. Among the various possible approaches, hybrid rice cultivation is the most feasible and practical one in view of its 10-15 per cent yield advantage over the high yielding varieties. To obtain the benefits of hybrid rice cultivation, it is essential to develop effective hybrid seed production techniques. Poor panicle exertion of CMS lines of most of the released hybrids of rice is affecting the seed yield considerably. To overcome this problem, gibberellic acid (GA3) is being used in hybrid seed production. But the high cost of it in India, limits its use in large quantity. Therefore, The aim of the present investigation was to test the effectiveness of GA_3 and search for other-cheaper alternatives and to enhance the effectiveness of GA_3. Various chemicals such as, GA_3, Boric acid, Urea, Glycine, etc. were twice applied either individually or in combination of various concentrations at 10% heading and 50% heading by hand sprayer. Total 9 different treatments were used and data were recorded on ten floral and yield traits.

The Percentage of exserted stigma (%), Anther length(mm), Panicle length(cm) , Filled Spikelets per panicle, Plat height (cm), Grain yield /plant(g) were highest found in application of GA3 80ppm + Glycine 80ppm coupled with flag leaf clipping and Rope pulling. Panicle exsertion (%),and Spikelets length (cm) were highest found in Glycine 80ppm coupled with flag leaf clipping and Rope pulling. The panicle exertion was higher to the extent of 40 per cent with Glycine 80ppm coupled wih coupled with flag leaf clipping and Rope pulling. The increases in seed yield with GA3 80ppm and Glycine 80ppm coupled with flag leaf clipping and Rope Pulling was to the extent of 200 per cent, over control. Spraying of GA380ppm in combination with Glycine 80ppm coupled with flag leaf clipping and Rope pulling resulted in higher profits. Results showed that Glycine 80ppm was found be alternative of Gibberellic acid.

Keywords : Rice, hybrids, seed yield, floral traits.

Introduction

Rice (*Oryza sativa* L.) is one of the most important staple cereal crops. Increasing the productions of rice is necessary to meet out the food requirement of growing population. Among the various possible approaches, hybrid rice cultivation is the most feasible and practical one in view of its 10-15 per cent yield advantage over the high yielding varieties. To obtain the benefits of hybrid rice cultivation, it is essential to develop effective hybrid seed production techniques.

To enhance the efficiency of hybrid seed production, it is necessary to increase the yield of hybrid seed by improving the out crossing capacity of CMS lines. The female parent of most of the released rice hybrids have problem of poor panicle exertion because of which nearly 25-30 per cent of the spikelets remain inside the flag leaf, resulting poor outcrossing and reduced hybrid seed yield. In China, application of gibberellic acid (GA_3) at fairly high concentration (150-225 g/ha) plays an important role in solving the problem of poor panicle exertion, besides enhancing wider glume opening, better stigma exertion and stigma receptivity, thereby increasing the outcrossing rate (Duan and Ma, 1992). But, the higher cost of GA_3 in India, is a limiting factor for its use at higher concentration in hybrid rice seed production. Thus, there is a need to findout the suitable substitutes for GA_3. Several cheaper chemicals like urea and boric acid are found to be promising to some extent in this regard (Prasad *et al.*, 1988). However, effect of alternate chemicals alone or in combination with GA_3

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A Critical Analysis on Knowledge Level of Farmers About Using Mobile Phone

R.K. Singh[1]*, R.K. Doharey[2], M. Singh[3] and A.P. Singh[4]

[1]Subject Matter Specialist, Agricultural Extension, Mahayogi Gorakhnath Krishi Vigyan Kendra, Chaukmafi (Peppeganj), Gorakhpur, Uttar Pradesh

[2]Professor & Head, [4]Research Scholar, Department of Extension Education, NDUA&T, Ayodhya, Uttar Pradesh

[3]Assistant Professor, Department of Extension Education, UPAC, Varanasi, Uttar Pradesh

ABSTRACT

Mobile phones have reduced the gap among farmers and buyers, now farmers directly communicate with customers and get price of their products from market. Mobile phones have also provided new approach to farmers to get latest information from meteorological department for weather conditions before using pesticides in their farms. However, internet is also disseminating information regarding price and marketing of goods and farmers are receiving information within minutes from all over the world. Into consideration of the above fact the study was conducted to examine the knowledge level of farmers about using mobile phone in the Milkipur tehsil of Ayodhya district, Uttar Pradesh during the agricultural year 2015-16. Selection of the respondents had done by simple random sampling method and 25 respondents from each village had taken to make a total sample size of 250 from the list of ten purposively selected villages for collection of primary data.

Keywords: Knowledge, Mobile phone, Primary data, Purposively, Simple random sampling

INTRODUCTION

In the 21st century agriculture is one of the divers industry which are increasing rural income as well as long term stability of its natural resources. This can create different activities which will affect farmers, stakeholder, customers and government industries. Information and communication technologies have transferred most important information about agriculture in developing countries. These developing countries now are connected with developed nations and getting the latest information and technologies regarding weather, natural resources and other related information (Rao, 2007).

In August 1995, the Chief Minister of West Bengal, Shri Jyoti Basu ushered in the cell phone revolution in India by making the first call to Union Telecom Minister Sukhram. Sixteen years later 4th generation services were launched in Kolkata. In India, out of every hundred citizens there are ninety people with mobile phone. A report by Kantar IMRB ICUBE (2018) highlighted that the number of internet users is 566 million as of December 2018. The report also finds that 87 per cent of the total user base, or 493 million Indians, are defined as regular users. Of this, 293 million active internet users reside in urban India, while there are 200 million active users in rural India. Not surprisingly, 97 per cent of users access the internet on their mobile device. According to the report, digital adoption is now being propelled by rural India. It is estimated that users in rural India are expected to reach 290 million by the end of 2019.

There are several reasons why mobile phones are considered as particularly important for development. First, beyond basic connectivity, mobile phones offer benefits such as mobility and security to owners (Donner, 2006). Second, due to their unique characteristics, the mobile phone is an especially good leap frogger: it works using the radio spectrum, as such there is no need to rely on physical infrastructure such as roads and phone wires, and base-stations can be powered using their own generators in places where there is no electrical grid (Economist, 2008). Third, mobile phones only require basic literacy, and therefore are accessible to a large segment of the population. Fourth, mobiles enjoy some technical advantages that make them particularly attractive

*Corresponding author email id: rahulrrext91@gmail.com

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Socio-economic Assessment of Farmers Having Mobile Phone: A Study in Ayodhya District of Uttar Pradesh

R. K. Singh[1], R. K. Doharey[2], Satyapriya[3], M. Singh[4], A. P. Singh[5], R. P. Singh[6] and G. P. Singh[7]

ABSTRACT

The paper investigate the magnitude of social parameters with effective use of mobile phone in farmer's decision making. This study examined in the Milkipur tehsil of Ayodhya district, Uttar Pradesh to know the socio-economic status of farmers having mobile phone during the agricultural year 2015-16. Simple random sampling method adopped for Selection of respondent and 25 respondents from each village had taken to make a total sample size of 250 from the list of ten purposively selected villages. A well-structured and pretested interview schedule developed for collection of data through personal interview method. The study exposed that the mass media sources like mobile phones, radio and television were the most preferred source of information. A deeper probe into the data indicated that mobile phone was leading one and got rank first with mean score value 1.57 among overall ICT tools which taken under study.

Key words: ICTs, mobile phone, interview schedule, simple random sampling, personal interview.

INTRODUCTION

ICT can be defined as technologies that enable the handling of information and facilitate different forms of communication between human actors, human beings and electronic systems. Overall, ICT is grouped together under two categories: the 'traditional' and the 'new'. Traditional ICTs are non-electronic media such as print and analogue technologies, including books and newspapers, radio, television, fixed-line telephones and facsimile machines.

New ICTs consist of computers and the data processing applications accessible through their use: email, the internet, word-processing, mobile phones, wireless technologies and other data processing applications. In August 1995, the Chief Minister of West Bengal, Shri Jyoti Basu ushered in the cell phone revolution in India by making the first call to Union Telecom Minister Sukhram. Sixteen years later 4th generation services were launched in Kolkata.

In India, out of every hundred citizens there are ninety people with mobile phone. A report by Kantar IMRB ICUBE (2018) highlighted that the number of internet users is 566 million as of December 2018. The report also finds that 87 per cent of the total user base, or 493 million Indians, are defined as regular users. 293 million active internet users reside in urban India, while there are 200 million active users in rural India. Not surprisingly, 97 per cent of users access the internet on their mobile device. According to the report, digital adoption is now being

[1]Subject Matter Specialist-Agril Extension, Mahayogi Gorakhnath Krishi Vigyan Kendra, Chaukmafi (Peppeganj), Gorakhpur (U.P.), [2]Professor & Head, [3]Research Scholar, Dept. of Ext. Edu., ANDUA&T, Kumarganj, Ayodhya (U.P.) [4]Principal Scientist (Agrl. Extension), Division of Agricultural Extension, IARI, New Delhi, [5]Assistant Professor, Dept. of Ext. Edu., UPAC, Varanasi (U.P) [6]Professor & Headm SVPUA&T, Meerut (UP) and [7]Assoc. Prof. & Head, Deptt. of Agricultural Extension, JV College, Baraut, Baghpat (UP).

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ISOLATION AND CHARACTERIZATION OF AMMONIA EXCRETING CYANOBACTERIUM *CYLINDROSPERMUM* SP. NDOP002

Om Prakash and N. Dwivedi*

Department of Botany, U.P. College (Autonomous), Varanasi, India

*Email: drnagendra.dwivedi@gmail.com

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ABSTRACT

Cylindrospermum sp. NDOP002 was isolated from agricultural fields of Azamgarh, U.P., India. It was characterized by morphological methods. Total chlorophyll a content was 18.5 µg/ mg dry weight. Organism achieved a stationary phase of growth after 15 days of cultivation. Ammonia excretion was monitored from 6 hrs. of culture to 20 days. The ammonia content of culture increased up to 7 days (Maximum amount of 3.23 µg/ ml) and then decreased. Approximately a constant amount of ammonia was maintained from 9th and onwards days of growth. Maximum glutamine synthetase (GS) activity of 8.33 mM γ-glutamyl hydroxamate min-1 mg chl-1 was observed on the 5th day of culture and then decreased. Approximately constant GS activity was observed after 9th and onward days of growth. Algalisation experiment showed an increase in growth parameter of rice plant in algalised set. Length of roots was 6.4-6.9 cm in non algalised and 7.2-7.6 cm in algalised rice plants whereas the length of shoots was 5.7-6.1 cm in non- algalised and 9.5-10.1 cm in algalised rice plants. The amount of ammonia in algalised set was 2.1 µg/ ml on the 10th day of the experiment. Experimental findings clearly suggest *Cylindrospermum* sp. NDOP002 as suitable inocula for algalisation of rice fields of Azamgarh district, U.P., India.

Keywords: Cyanobacteria, *Cylindrospermum* sp. NDOP002 and Ammonia

INTRODUCTION

The contribution of cyanobacteria in enriching paddy fields particularly nitrogen content is well established. The Paddy field ecosystem is known to support the luxuriant growth of cyanobacteria. Besides, providing fixed nitrogen cyanobacteria also improves plant growth by secreting growth regulators, siderophores, etc. The abundance of cyanobacteria was recorded more in tropical and subtropical regions compared to other regions of the world. Wide variation in cyanobacterial abundance was noticed in rice fields i.e. 75% of the total algal flora of Indian rice fields (Pandey, 1965), 86% of the total algal flora of southern Iraq (Al-Kaisi, 1976), 70% of algal flora if Italian soil (Materasi and Balloni, 1965). Algalisation of fields with cyanobacteria has shown an increase in nitrogen content up to 14% (Rao and Burns 1990, Singh and Bisoyi, 1989). Nitrogen fixation of 15-53 kg/ hectare (h)/ year(y) have been observed by cyanobacteria (Kaushik, 2014). Filamentous heterocystous forms are well-known biological nitrogen fixers. Several non-heterocystous forms i.e. *Gleoecapsa* (Wyatt and Silvery, 1969), *Plectonema boryanum* (Stewart and Lex, 1970), *Trichodesmium* sp. (Carpenter and Price, 1976) have also been reported to fix nitrogen fixation. Some species of heterocystous cyanobacteria i.e. *Nostoc*, *Anabaena*, *Cylindrospermum*, *Anabaenopsis*, *Scytonema*, *Calothrix*, *Stigonema*, *Tolipothrix*, *Aulosira*, *Mastigocladus*, *Fischerella*, *Gleoetrichia*, *Hapalosiphon*, *Chlorogloeopsis*, *Campylonema*, *Rivularia*, *Nostochopsis*, *Chlorogloea*, *Schytonematopsis*, *Westiellopsis*, and *Wollea* are efficient nitrogen fixers (Venkataraman, 1993). Some cyanobacterial strains i.e., *Aulosira fertilissima*, *Anabaena variabilis*, *Nostoc muscorum*, and *Tolypothrix Tenuis* are being used in algal biofertilizer technology (Kaushik, 2014). Most of the fixed nitrogen of cyanobacteria is released only after decomposition and autolysis (Martinenz, 1984). The majority of cyanobacterial strains release an insignificant amount of ammonia during their growth period (Martinenz, 1984). Search for continuous ammonia secreting cyanobacterial strains are one of the primary goals of plant biologist. The cyanobacterial strain was isolated, characterized, and studied for ammonia secreting properties.

MATERIALS AND METHODS

Cyanobacterium was isolated from soil collected from agricultural fields of Azamgarh, U.P., India following procedures as mentioned by Mishra *et al.*, 2019. The cyanobacterial strain was purified by repeated streaking method and grown in BG-11 medium without nitrogen supplementation. It was maintained in a culture room set at 28±20c and illuminated by the fluorescent tube of 40w with 14: 10 light and dark cycle.

Morphological parameters as followed by Mishra *et al.*, 2019 were used for the identification of cyanobacterium. The morphological parameters of cyanobacterium were studied by viewing at 400x and 1000x of Olympus 21Xi microscope. Morphological characters were analyzed by Magnus PRO Micro measurement & Image analysis