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1. Malik P, **Singh S**, Singh M.

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Water balancing actions of sodium and potassium chlorides for curcumin antioxidant activities in oil-water nanoformulations

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ABSTRACT

Ethanol and glycerol being 100 % water soluble hamper free radical scavenging activities (FRSA) of dispersed antioxidants, causing water scarcity as water dipoles balance the ζ-potential and stern layer kinetics. The strong electrolytes reoriented the secondary bonds of ethanol and glycerol to soften a medium resistance for philicphobic continuity attained with $M_c\langle t.n\rangle$ state function. Herein, NaCl/KCl supplemented, sodium dodecyl sulphate (SDS), tweens (Tw-20 and Tw-40) catalysed cottonseed oil (CSO) nanoformulations in water to monodisperse curcumin (curc), are reported. The Na^+, K^+, Cl^- nanoionic hydration spheres (NHS) have re-engaged dipolar water molecules attached with ethanol and glycerol that balance a monodispersity *via* friccohesity (σ) enabling (50.61–99.84)% 2,2-diphenyl-1-picrylhydrazyl (DPPH$^{\cdot}$) scavenging. The NHS of Na^+, K^+, and Cl^- have homogenized curc distribution elucidated *via* surface tension, γ, viscosity, η, friccohesity, σ, isentropic compressibility, κ_s, sound velocity, u and acoustic impedance, Z as binding forces (BF) controls. The (18.08–28.72), (32.82–37.06); (33.80–41.02), (29.36–35.88); (37.80–47.66), (30.13–41.46) γ with SDS, Tw-20 and Tw-40, have inferred 1.15–3.45 g NaCl and 1.75–5.2 g KCl dispersion activities. Alongside, the (0.020772–0.036525) and (0.022512–0.032197) σ, as secondary cohesive forces (CF) have revealed NHS shift in SDS-NaCl and Tw-20-KCl formulations. Ninety NaCl/KCl-SDS, Tw-20, Tw-40 permutations enabled (55.84–99.72), (50.60–99.84), (53.81–91.93)% DPPH$^{\cdot}$ scavenging at 4.47–7.31 pH. Friccohesity resonance energy transfer (FRET) of optimized nanoformulations depicted H$^{\cdot}$ to form H–N bond for DPPH$^{\cdot}$ scavenging illustrated with ΔH, ΔS, $E_a < 0$. The NaCl/KCl could be used with other polyphenols as these have increased surface energy, enabling FRET for intimate proximities.

1. Introduction

Thermodynamically, kinetically, and tentropically (TKT) stable nanoformulations of higher friccohesity have been used to monodisperse biomolecules without sonication that induces critical and permanent electronic transitions. Structural activities attained on monodispersing the biomolecules by transforming their cohesive forces (CF) into adhesive forces (AFs) enhance a physiological absorption of low bioavailability natural polyphenols [1–3]. Dynamic shear equilibration, *vis-à-vis* friccohesic and tentropic activities homogenize a distribution on gradual expression of integrated chemical potentials as sustained Brownian activities [4–8] (eq (1). The p, m and $\hat{H}$ are linear momentum, dispersed phase mass and Hamiltonian operator as total energy,xis position at t seconds, V and ψ are electrostatic potential energy (EPE) as

$$\hat{H}\psi = \frac{p^2}{2m}\psi + V(x,t)\psi \quad (1)$$

Thereby, choosing compatible interlocutors for therapeutic foods becomes a pre-requisite for food chemists [9,10]. Of late, much attention has been garnered on using nonionic surfactants, carbohydrate derivatives with edible electrolytes for sustained curc activities *via* enhanced physiological absorption. Our recent studies on modulating NaCl and KCl hydration sphere (HS) activities encouraged us to study their impact on curc monodispersion [11]. The Na^+ ($2s^22p^6$) and K^+ ($3s^23p^6$) valence electrons induce distinct alignments of dipolar water molecules (DWMs) *via* their stronger and weaker nuclear charges. Such NaCl and KCl attributes fractionate the DWMs cohesivity into shear moderating secondary CF [12]. Since alone Na^+ or K^+ can't exhibit neurological sensing, their ionic activity *vis-à-vis* NHS aligns to Na-K

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2. Sarangle Y, **Bamel K** & Purty RS

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Identification of Acetylcholinesterase Like Gene Family and Its Expression Under Salinity Stress in *Solanum lycopersicum*

Yashika Sarangle[1] · Kiran Bamel[2] · Ram Singh Purty[1]

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Abstract
In human, acetylcholinesterase (AChE) is a cholinergic enzyme involved in the hydrolysis of neurotransmitter acetylcholine (ACh) into its constituents, choline, and acetate. In plants, the biological functions of AChE are lacking and its existence has been recognized by indirect evidence of its activity. Therefore, in the present investigation, a systematic analysis of the *AChE* gene family in tomato was performed by integrating structural features, phylogenetic analysis, and its enzyme activity. Using the computational approach, we have identified 87 *SlAChE* genes containing GDSL lipase/acylhydrolase domain in tomato. In silico expression analysis of *SlAChE* genes showed up-and down regulation under salinity stress condition. The activity of the AChE enzyme was further confirmed using Ellman assay. Promoter analysis of *SlAChE* genes using Plant-CARE showed the presence of several cis-acting elements including abiotic stress, light, and hormone regulatory elements. In silico screening indicated that tomato AChE homologs are widely distributed in plants. Syntenic analysis revealed several gene pairs between tomato and other species. Interestingly, the deduced amino acid sequence of human AChE showed no similarity with that of tomato AChE sequence. However, the binding energy of *SlAChE* enzyme to agonists and antagonists was almost identical to that of human AChE. This preliminary study of ChE-like activity in plants may open the way for additional research in non-neuronal role in plants. The studies provide a theoretical basis for further elucidating the functions of the *AChE* gene family at the molecular level.

Keywords Expression profile · GDSL domain · MicroRNAs · Acetylcholine · Computational approach · Promoter analysis

Introduction

The discovery of acetylcholine (ACh) in cells other than animal cells took place for almost 75 years. There have been numerous reports of it being detected in bacteria and fungi as well as lower and higher plants since then (Tretyn and Kendrick 1991; Wessler et al. 2001). Animals use neurotransmitters to transmit information via an electrical impulse along their neurons following information perceived by the receptors.

The cholinergic system is a set of enzymes and receptors linked with the function of ACh (Roychoudhury 2020). The signalling involves the presence of two enzymes, a synthesizing enzyme i.e. choline acetyltransferase (ChAT) produced in the cholinergic cell body and transported down the axon to where the nerve endings are known to be located (Nachmansohn and Machado 1943), and a hydrolysing enzyme

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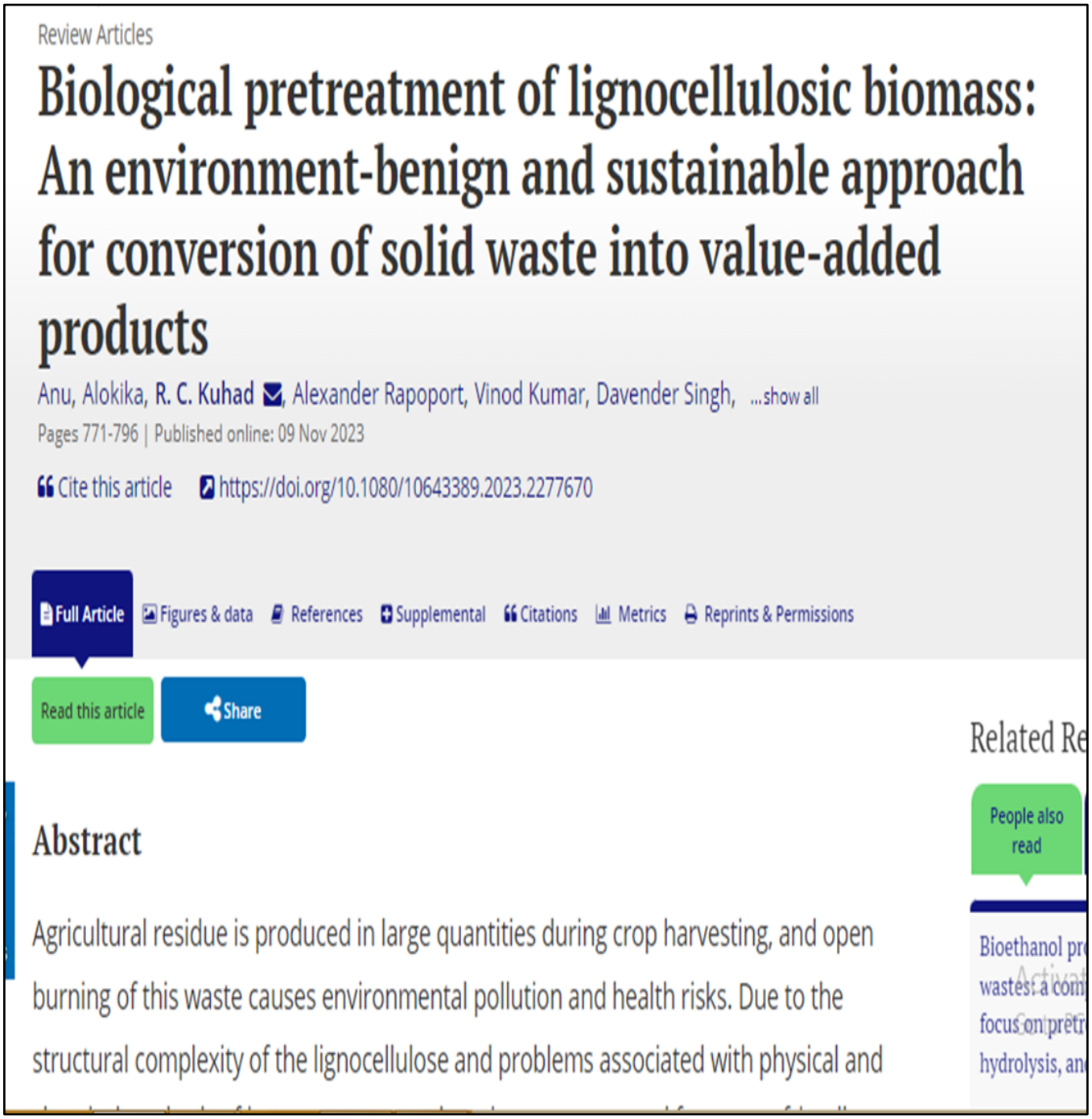
3. Alokika A, Kuhad RC, Rapoport A, Kumar V, Singh D, **Kumar V**, Tiwari SK, Ahlawat S & Singh B



Review Articles

Biological pretreatment of lignocellulosic biomass: An environment-benign and sustainable approach for conversion of solid waste into value-added products

Anu, Alokika, R. C. Kuhad, Alexander Rapoport, Vinod Kumar, Davender Singh, ...show all

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Abstract

Agricultural residue is produced in large quantities during crop harvesting, and open burning of this waste causes environmental pollution and health risks. Due to the structural complexity of the lignocellulose and problems associated with physical and

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4. Saini KK, Rani R, Muskan, **Khanna N**, Mehta B & Kumar K.

Current Organic Chemistry, 2023, 27, 119-129

MINI-REVIEW ARTICLE

An Overview of Recent Advances in Hantzsch's Multicomponent Synthesis of 1,4-Dihydropyridines: A Class of Prominent Calcium Channel Blockers

Keshav Kumar Saini[1,2], Rupal Rani[1], Muskan[1], Neena Khanna[3], Bhupinder Mehta[4], and Rakesh Kumar[1,*]

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Rakesh Kumar

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Abstract: Among all the heterocyclic scaffolds, 1,4-dihydropyridine (1,4-DHPs) is an important class of nitrogen-containing heterocyclic compounds possessing prominent therapeutic effects, which play an essential role in pharmaceutical chemistry. Multicomponent reactions (MCRs) have proven to be an invaluable tool for swiftly synthesizing large and structurally diverse molecules from simple starting materials. The chemists have discovered a large number of new MCRs for the synthesis of 1,4-dihydropyridine. The synthesis of 1,4-Dihydropyridine via multicomponent reaction is an efficient procedure in terms of delivering adequate structural diversity, which is essential for the process of discovering new 1,4-DHPs compounds and their therapeutics.1,4-dihydropyridines are well-known L-type calcium channel blockers. This review aims to study and summarize the recent developments in the multicomponent synthesis of 1,4-dihydropyridines and their fused analogs that act as potent antihypertensive drugs. The findings of this study will prove to be an invaluable resource for researchers in the areas of heterocyclic chemistry, medicinal chemistry, and drug design.

Keywords: Calcium channel blockers, multicomponent reactions, dihydropyridine, hypertension, one-pot synthesis, hantzsch synthesis.

1. INTRODUCTION

Cardiovascular diseases (CVD) include a wide range of heart and blood vessel-related illnesses, including coronary artery disease [1], peripheral artery disease [2], aortic atherosclerosis [3], and cerebrovascular disease [4, 5]. Hypertension is the core reason for these diseases and is also known as a "silent killer" since it shows no symptoms [6]. Cardiovascular disorders are one of the prominent causes of mortality worldwide. According to a World Health Organisation (WHO) report in June 2021, CVDs accounted for 17.9 million deaths in 2019, which was nearly 32% of the worldwide total death toll. Stroke and heart attack are the primary reason for 85% of the deaths due to CVD [7]. Hypertension or high blood pressure is associated with damage to arteries (narrowed arteries, most important heterocyclic rings, exhibiting prominent therapeutic properties that may be used in a wide range of medicinal applications [13]. In recent decades, one-pot multicomponent reactions have surpassed classical synthesis in popularity. In a one-pot multicomponent reaction (MCR), three or more reactants are incorporated into a single reaction vessel to yield a product that comprises measurable amounts of all of the initial reactants without separation and purification of intermediates [14, 15]. Multicomponent reactions have many advantages over classical multistep synthesis, like high atom economy, simplicity, potential as a technique for green synthesis, low waste generation, efficiency, time savings, cost minimization, etc. [16, 17]. Notably, dihydropyridines are paramount scaffolds that are used in calcium channel-blocking medicines [18].

5. Mittal A, Nagpal M, Vashistha VK, **Arora R** & Issar U

Free Radical Research

Recent advances in the antioxidant activity of metal-curcumin complexes: a combined computational and experimental review

6. Issar U, **Arora R** & Kakkar R

Research Articles

In silico studies of the interaction of the minor groove binder Hoechst 33258 with B-DNA

Upasana Issar, Richa Arora & **Rita Kakkar**

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Abstract

Interaction of the minor groove binder, Hoechst 33258, with the Dickerson-Drew DNA dodecamer sequence has been investigated using docking, MM/QM, MM/GBSA and molecular dynamics computations to study the modes of binding and the interactions responsible for the binding. Besides the original Hoechst 33258 ligand (**HT**), a total of 12 ionization and stereochemical states for the ligand are obtained at the physiological pH and have been docked into B-DNA. These states have one or the other or both

7. Garg A, Karhana S, Bano A, Khan IA, **Reeta**, Nidhi, Khan MA

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Network pharmacology and molecular docking study-based approach to explore mechanism of benzimidazole-based anthelmintics for the treatment of lung cancer

Aakriti Garg [1,2], Sonali Karhana [1], Aysha Bano [1], Imran A Khan [3], Reeta [4], Nidhi [1], Mohd Ashif Khan [1]

Affiliations + expand

PMID: 37740654 DOI: 10.1080/07391102.2023.2258419

Abstract

Emerging studies have reported the potential anticancer activity of benzimidazole-based anthelmintics (BBA) against lung cancer (LC). However, mechanism underlying the anticancer activity of BBA is unclear. Therefore, in the current study, network pharmacology and molecular docking-based approach were used to explore the potential molecular mechanism for the treatment of LC. The potential targets for BBA were obtained from multiple databases including SwissTargetPrediction, Drug Bank, Therapeutic Target Database, and Comparative Toxicogenomics Database while LC targets were collected from DisGeNet gene discovery platform, Integrated Genomic Database of NSCLC, Catalogue of Somatic Mutations in Cancer and Online Mendelian Inheritance in Man database. Protein-protein interaction (PPI) diagram of common targets was constructed using STRING online

8. **Kandpal B M**, Tyagi R, Tehlan S, Singh S, Gupta R, MongaY, & GuptaA.

J. Integr. Sci. Technol. 2024, 12(1), 709

Journal of Integrated
SCIENCE & TECHNOLOGY

4-Amino-3-hydrazino-5-mercapto-1,2,4,-triazole (PURPALD) in organic chemicals analysis: Distinguishing aldehydes and ketones

Bhaskar Mohan Kandpal[1], Richa Tyagi[2], Sarita Tehlan[3], Shivendra Singh[4], Radhika Gupta[2], Yukti Monga[2], Ashu Gupta[2]*

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Article

ABSTRACT

4-Amino-3-hydrazino-5-mercapto-1,2,4-triazole (AHMT) has emerged as a valuable reagent in organic analysis, particularly for distinguishing aldehydes and ketones. The application of AHMT in the differentiation of aldehydes and ketones in organic compounds. The reaction mechanism between AHMT and carbonyl compounds is explored, highlighting the selective and sensitive nature of AHMT towards aldehydes and ketones. Various analytical techniques, including spectroscopy, and chemical methods, employed in conjunction with AHMT for analysis are discussed. This abstract serves as a valuable resource for researchers and analysts working in the field of organic analysis seeking to utilize AHMT as a reliable tool for distinguishing aldehydes and ketones.

Keywords: Aldehyde, Ketone, Aromatic carbonyls, Sugar, PURPALD

INTRODUCTION

The carbonyl group, due to its wide range of reactivity and synthetic uses, is a significant functional group frequently referred to as the basis of organic synthesis. Aldehydes and ketones are two prominent groups of compounds in organic chemistry. A typical and widely used test for the identification of carbonyl groups is the reaction of aldehydes and ketones with 2,4-dinitrophenylhydrazine, which results in a coloured precipitate that is frequently orange or red. Different tests are typically used to distinguish between aldehydes and ketones. These are: (i) Fehling's test, (ii) Benedict's test, (iii) Tollen's test, (iv) Chromium trioxide-

The identification and distinction of aldehydes from ketones is greatly aided by spectroscopic methods. Both these classes of compounds display the carbon-oxygen double bond (-C=O) stretching frequency (IR) at about 1725 cm^{-1}. In addition, the carbon hydrogen stretching frequency of the formyl group (-CH=O) appears in the range 2695-2730 cm^{-1}. Very often two bands near 2720 and 2920 cm^{-1} are observed (Fermi resonance). The proton magnetic resonance spectrum shows a downfield aldehyde proton signal in the range of 9.5-10 ppm. The spectroscopic methods have largely supplemented the traditional chemical tests. However, the classical chemical tests have considerable educative value and will continue to be used in qualitative analysis.

9. Mohan C, Kumari P, Kumari N & Negi A.

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Article

Fabrication of Colored Polymeric Membrane Using Clay-Based Nano Pigments of Safranin O (SO) Dye

Chandra Mohan [1], Priyanka Kumari [2], Neeraj Kumari [1,*] and Arvind Negi [3,*]

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Abstract: In the present work, a novel methodology was developed for the fabrication of clay-based nano pigments with enhanced thermal stability and used further as a colorant to prepare polymeric membranes. Initially, the batch extraction studies were performed to analyze the maximum adsorption of Safranin O (SO) dye onto pristine montmorillonite (Mt) and organo montmorillonite (OMt) by varying different parameters like pH, contact time, and concentration. It was confirmed from batch extraction studies that the adsorption efficacy of pristine Mt for SO was found to be more than OMt due to their negatively charged surface. Clay-based nano pigments were fabricated by considering the optimized condition where the maximum uptake of SO was observed and further characterized by XRD, FTIR, TGA, and SEM techniques. XRD studies confirmed the intercalation of SO dye while FTIR spectra revealed surface interaction of the dye with Mt/OMt. TGA studies showed that the clay-based nano pigments had more thermal stability than pure SO. Nano pigments were used as colorants to prepare thin, transparent, and homogeneously dispersed polymeric membranes through the solvent casting method. XRD studies of the polymeric membrane confirmed that the intercalation of poly methylmethacrylate (PMMA) into the interlayer of clay increases interlayer spacing, which was further confirmed by the TEM analysis. The mechanical properties of the PMMA polymeric membrane were also enhanced after the dispersion of clay-based nano pigments.

Keywords: nano pigments; clay; safranin O; polymeric membrane; adsorption

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Citation: Mohan, C.; Kumari, P.; Kumari, N.; Negi, A. Fabrication of Colored Polymeric Membrane Using Clay-Based Nano Pigments of Safranin O (SO) Dye. *Membranes* 2023, *13*, 618. https://doi.org/10.3390/membranes13070619

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1. Introduction

Various types of clay and their derivatized dyes or pigments have been widely used as colorants to generate various colored design materials. Dyes and pigments are primary organic coating components [1,2]. The primary purpose of dyes and pigments is to color the coating materials and improvespecific operational properties. However, dyes and pigments also have some drawbacks. Most pigments show good colorimetric properties but suffer from poor dispersion of polymeric materials and low-grade heat and corrosion resistance. Organic dyes are easily dispersed in polymeric materials, but have poor durability, chromatic properties, and resistance against UV radiation [3–6]. Although

10. Mohan C, Kumari N, Jeandet P, **Kumari P** & Negi A

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Synthesis of Nano Pigments Using Clay Minerals and Organic Dyes and Their Application as Colorants in Polymer Matrix

Chandra Mohan [1], Neeraj Kumari [1,*], Philippe Jeandet [2], Priyanka Kumari [3] and Arvind Negi [4,*]

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[2] Unit RIBP, USC INRAe 1488, University of Reims, 51100 Reims, France
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Abstract: A new generation of clay-based nano pigments has been introduced, providing the advantage of both inorganic pigments and organic dyes. These nano pigments have been synthesized through a stepwise procedure where, initially, an organic dye is adsorbed onto the surface of the adsorbent, and then dye adsorbed adsorbent is used as pigment for further applications. The objective of the current paper was to examine the interaction of non-biodegradable toxic dyes, Crystal Violet (CV) and Indigo Carmine (IC), with clay minerals (montmorillonite (Mt), vermiculite (Vt), and clay bentonite (Bent)) and their organically modified forms (OMt, OBent, and OVt) and to develop a novel methodology for the synthesis of the value-added products and clay-based nano pigments without creating second generation waste materials. In our observation, the uptake of CV was more intense onto pristine Mt, Bent, and Vt, and the uptake of IC was more onto OMt, OBent, and OVt. CV was found to be in the interlayer region of Mt and Bent, as supported by XRD data. Zeta potential values confirmed the presence of CV on their surface. In contrast, in the case of Vt and organically modified forms, the dye was found on the surface, confirmed by XRD and zeta potential values. In the case of indigo carmine, the dye was found only on the surface of pristine Mt, Bent, Vt, and organo Mt, Bent, Vt. During the interaction of CV and IC with clay and organoclays, intense violet and blue-colored solid residues were obtained (also known as clay-based nano pigments). The nano pigments were used as colorants in a poly (methyl-methacrylate) (PMMA) polymer matrix to form transparent polymer films.

Keywords: basic dyes; anionic dyes; nano pigments; polymeric films; textile

Citation: Mohan, C.; Kumari, N.; Jeandet, P.; Kumari, P.; Negi, A. Synthesis of Nano Pigments Using Clay Minerals and Organic Dyes and Their Application as Colorants in Polymer Matrix. *Micromachines* **2023**, *14*, 1087. https://doi.org/10.3390/mi14051087

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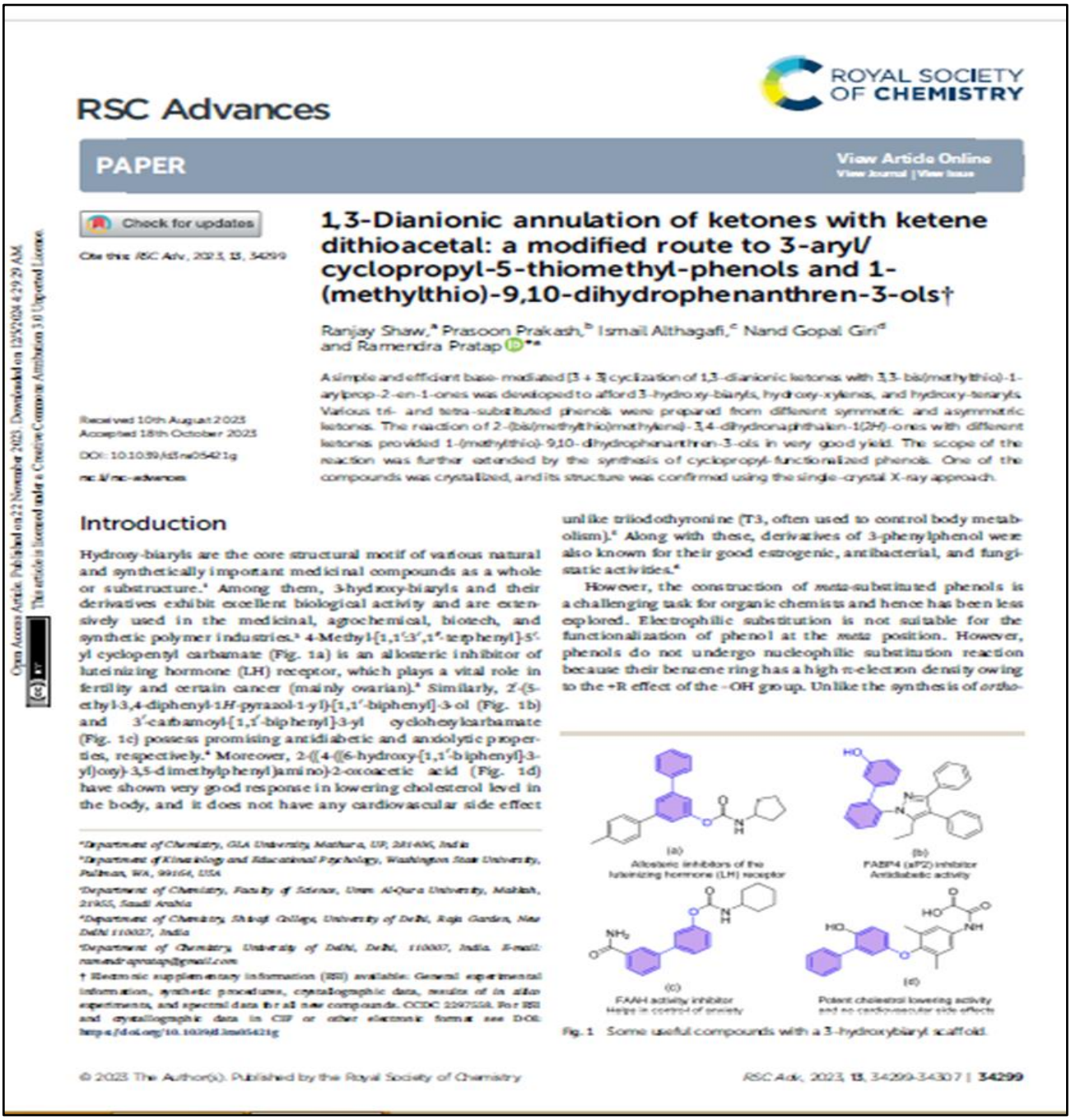
1. Introduction

Among various types of clay minerals, such as those of the smectite group, including

11. Shaw R, Prakash P, Althagafi I, **Giri NG** & Pratap R



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1,3-Dianionic annulation of ketones with ketene dithioacetal: a modified route to 3-aryl/cyclopropyl-5-thiomethyl-phenols and 1-(methylthio)-9,10-dihydrophenanthren-3-ols†

Ranjay Shaw,[a] Prasoon Prakash,[b] Ismail Althagafi,[c] Nand Gopal Giri[d] and Ramendra Pratap[a]*

A simple and efficient base-mediated [3 + 3] cyclization of 1,3-dianionic ketones with 3,3-bis(methylthio)-1-arylprop-2-en-1-ones was developed to afford 3-hydroxy-biaryls, hydroxy-xylenes, and hydroxy-terearyls. Various tri- and tetra-substituted phenols were prepared from different symmetric and asymmetric ketones. The reaction of 2-(bis(methylthio)methylene)-3,4-dihydronaphthalen-1(2*H*)-ones with different ketones provided 1-(methylthio)-9,10-dihydrophenanthren-3-ols in very good yield. The scope of the reaction was further extended by the synthesis of cyclopropyl-functionalized phenols. One of the compounds was crystallized, and its structure was confirmed using the single-crystal X-ray approach.

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Introduction

Hydroxy-biaryls are the core structural motif of various natural and synthetically important medicinal compounds as a whole or substructure.[1] Among them, 3-hydroxy-biaryls and their derivatives exhibit excellent biological activity and are extensively used in the medicinal, agrochemical, biotech, and synthetic polymer industries.[2] 4-Methyl-[1,1′:3′,1″-terphenyl]-5′-yl cyclopentyl carbamate (Fig. 1a) is an allosteric inhibitor of luteinizing hormone (LH) receptor, which plays a vital role in fertility and certain cancer (mainly ovarian).[3] Similarly, 2′-(5-ethyl-3,4-diphenyl-1*H*-pyrazol-1-yl)-[1,1′-biphenyl]-3-ol (Fig. 1b) and 3′-carbamoyl-[1,1′-biphenyl]-3-yl cyclohexylcarbamate (Fig. 1c) possess promising antidiabetic and anxiolytic properties, respectively.[4] Moreover, 2-([4-([6-hydroxy-[1,1′-biphenyl]-3-yl]oxy)-3,5-dimethylphenyl]amino)-2-oxoacetic acid (Fig. 1d) have shown very good response in lowering cholesterol level in the body, and it does not have any cardiovascular side effect unlike triiodothyronine (T3, often used to control body metabolism).[5] Along with these, derivatives of 3-phenylphenol were also known for their good estrogenic, antibacterial, and fungistatic activities.[6]

However, the construction of *meta*-substituted phenols is a challenging task for organic chemists and hence has been less explored. Electrophilic substitution is not suitable for the functionalization of phenol at the *meta* position. However, phenols do not undergo nucleophilic substitution reaction because their benzene ring has a high π-electron density owing to the +R effect of the –OH group. Unlike the synthesis of *ortho*-

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† Electronic supplementary information (ESI) available: General experimental information, synthetic procedures, crystallographic data, results of in silico experiments, and spectral data for all new compounds. CCDC 2297558. For ESI and crystallographic data in CIF or other electronic format see DOI: https://doi.org/10.1039/d3ra05421g

Fig. 1 Some useful compounds with a 3-hydroxybiaryl scaffold.

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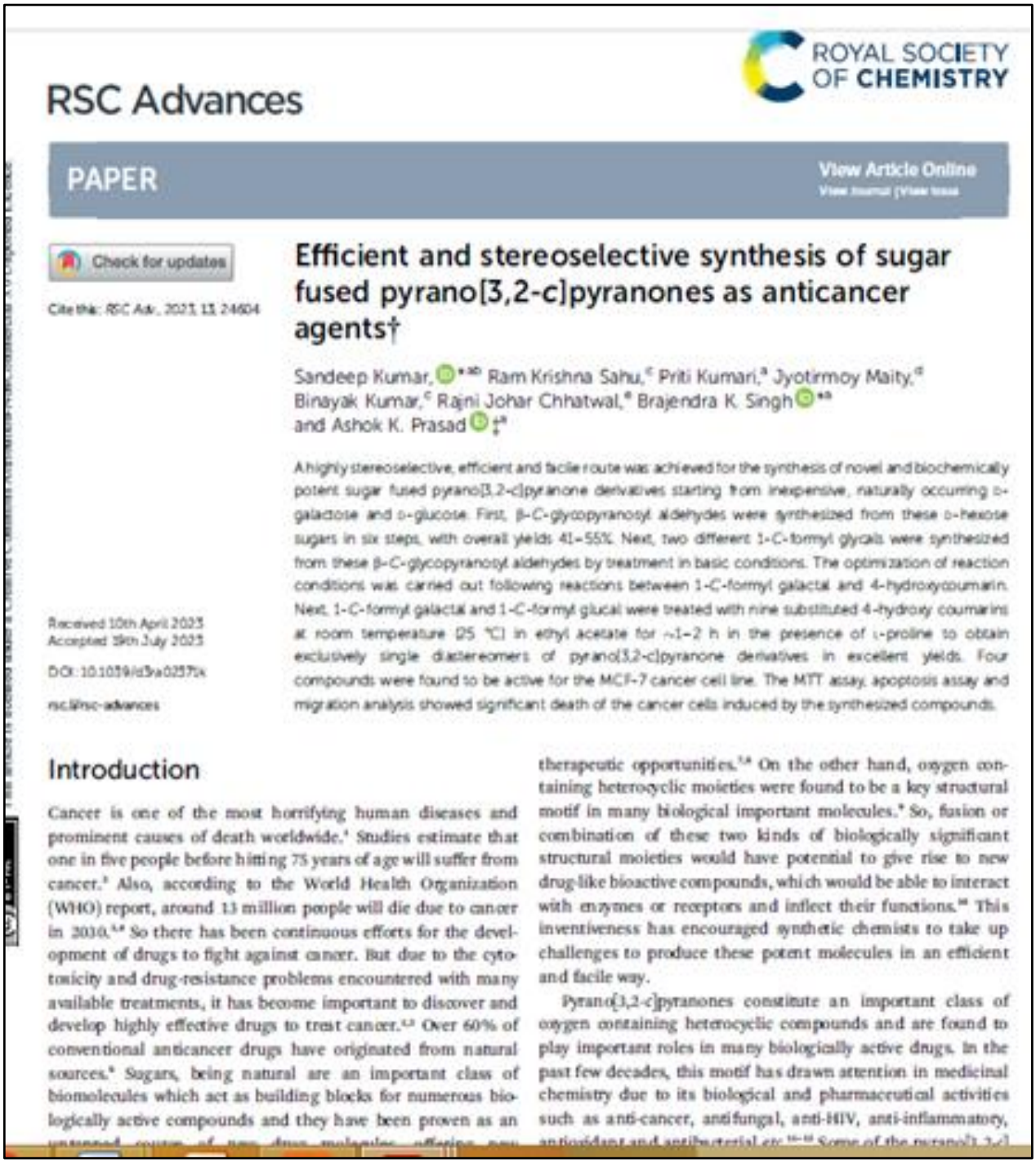
12. Kumar S, Sahu RK, **Kumari P**, Maity J, Kumar B, Chhatwal RJ, Singh BK & Prasad AK..



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Efficient and stereoselective synthesis of sugar fused pyrano[3,2-c]pyranones as anticancer agents†

Sandeep Kumar,[a,b] Ram Krishna Sahu,[c] Priti Kumari,[a] Jyotirmoy Maity,[d] Binayak Kumar,[c] Rajni Johar Chhatwal,[e] Brajendra K. Singh[a,b] and Ashok K. Prasad[a]*

A highly stereoselective, efficient and facile route was achieved for the synthesis of novel and biochemically potent sugar fused pyrano[3,2-c]pyranone derivatives starting from inexpensive, naturally occurring D-galactose and D-glucose. First, β-C-glycopyranosyl aldehydes were synthesized from these D-hexose sugars in six steps, with overall yields 41–55%. Next, two different 1-C-formyl glycals were synthesized from these β-C-glycopyranosyl aldehydes by treatment in basic conditions. The optimization of reaction conditions was carried out following reactions between 1-C-formyl galactal and 4-hydroxycoumarin. Next, 1-C-formyl galactal and 1-C-formyl glucal were treated with nine substituted 4-hydroxy coumarins at room temperature (25 °C) in ethyl acetate for ~1–2 h in the presence of L-proline to obtain exclusively single diastereomers of pyrano[3,2-c]pyranone derivatives in excellent yields. Four compounds were found to be active for the MCF-7 cancer cell line. The MTT assay, apoptosis assay and migration analysis showed significant death of the cancer cells induced by the synthesized compounds.

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Introduction

Cancer is one of the most horrifying human diseases and prominent causes of death worldwide.[1] Studies estimate that one in five people before hitting 75 years of age will suffer from cancer.[2] Also, according to the World Health Organization (WHO) report, around 13 million people will die due to cancer in 2030.[3,4] So there has been continuous efforts for the development of drugs to fight against cancer. But due to the cytotoxicity and drug-resistance problems encountered with many available treatments, it has become important to discover and develop highly effective drugs to treat cancer.[4,5] Over 60% of conventional anticancer drugs have originated from natural sources.[6] Sugars, being natural are an important class of biomolecules which act as building blocks for numerous biologically active compounds and they have been proven as an

therapeutic opportunities.[7,8] On the other hand, oxygen containing heterocyclic moieties were found to be a key structural motif in many biological important molecules.[9] So, fusion or combination of these two kinds of biologically significant structural moieties would have potential to give rise to new drug-like bioactive compounds, which would be able to interact with enzymes or receptors and inflect their functions.[10] This inventiveness has encouraged synthetic chemists to take up challenges to produce these potent molecules in an efficient and facile way.

Pyrano[3,2-c]pyranones constitute an important class of oxygen containing heterocyclic compounds and are found to play important roles in many biologically active drugs. In the past few decades, this motif has drawn attention in medicinal chemistry due to its biological and pharmaceutical activities such as anti-cancer, antifungal, anti-HIV, anti-inflammatory,

13. Kumar R, Chhikara BS, Zeybekler SE, Gupta DS, Kaur G, Chhillar M**, Aggarwal AK,** & Rahdar A

Volume 12, Issue 5
October 2023

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JOURNAL ARTICLE

Nanotoxicity of multifunctional stoichiometric cobalt oxide nanoparticles (SCoONPs) with repercussions toward apoptosis, necrosis, and cancer necrosis factor (TNF-α) at nano-biointerfaces

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Rajiv Kumar ✉, Bhupender S Chhikara, Simge Er Zeybekler, Dhruv Sanjay Gupta, Ginpreet Kaur, Mitrabasu Chhillar, Anil K Aggarwal, Abbas Rahdar

Toxicology Research, Volume 12, Issue 5, October 2023, Pages 716–740,
https://doi.org/10.1093/toxres/tfad086
Published: 29 September 2023 **Article history** ▾

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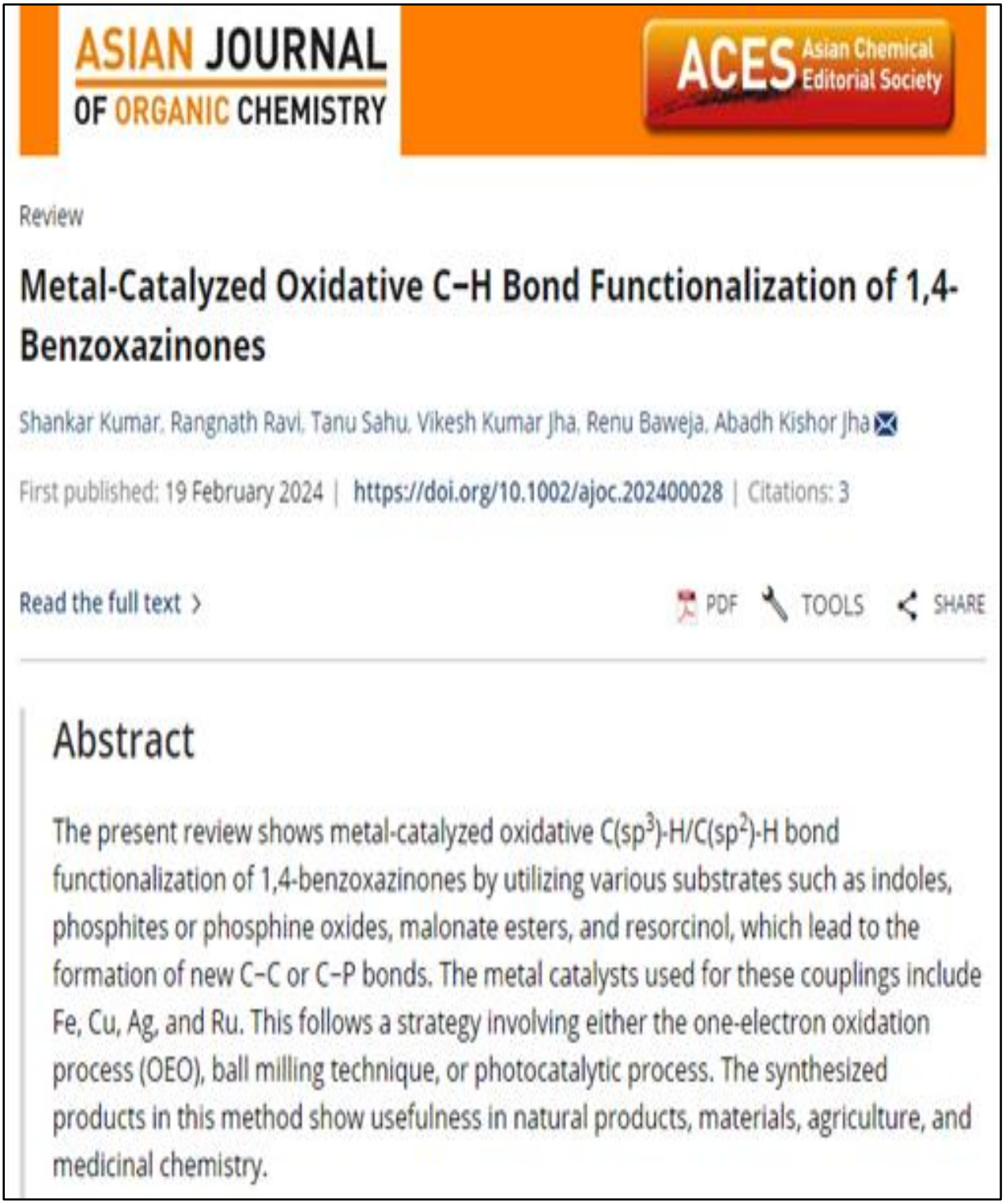
Abstract

Introduction

Apoptosis, necrosis, and cancer necrosis factor (TNF-a) are all impacted by the nanotoxicity of multifunctional stoichiometric cobalt oxide nanoparticles (SCoONPs) at nano-biointerfaces. The creation of multi-functional nanoparticles has had a considerable impact on the transport of drugs and

14. Kumar S, **Ravi R**, Sahu T, Kumar Jha, V, **Baweja R**, & Jha AK



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ACES Asian Chemical Editorial Society

Review

Metal-Catalyzed Oxidative C–H Bond Functionalization of 1,4-Benzoxazinones

Shankar Kumar, Rangnath Ravi, Tanu Sahu, Vikesh Kumar Jha, Renu Baweja, Abadh Kishor Jha

First published: 19 February 2024 | https://doi.org/10.1002/ajoc.202400028 | Citations: 3

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Abstract

The present review shows metal-catalyzed oxidative C(sp^3)-H/C(sp^2)-H bond functionalization of 1,4-benzoxazinones by utilizing various substrates such as indoles, phosphites or phosphine oxides, malonate esters, and resorcinol, which lead to the formation of new C–C or C–P bonds. The metal catalysts used for these couplings include Fe, Cu, Ag, and Ru. This follows a strategy involving either the one-electron oxidation process (OEO), ball milling technique, or photocatalytic process. The synthesized products in this method show usefulness in natural products, materials, agriculture, and medicinal chemistry.

15. Jain A, Kumar R, Mothsra P, Sharma AK, Singh AK & **Kumar Y**

Review > Curr Top Med Chem. 2024;24(21):1829-1855.
doi: 10.2174/0115680266286294240610102911.

Recent Biochemical Advances in Antitubercular Drugs: Challenges and Future

Akanksha Jain [1], Rajesh Kumar [2], Poonam Mothsra [3], Atul Kumar Sharma [4], Anil Kumar Singh [5], Yogesh Kumar [3]

Affiliations + expand

PMID: 38919089 DOI: 10.2174/0115680266286294240610102911

Abstract

Tuberculosis (TB) is one of the leading causes of death world-wide after AIDS. It infects around one-third of global population and approximately two million people die annually from this disease because it is a very contagious disease spread by *Mycobacterium tuberculosis*. The increasing number of drug-resistant strains and the failure of conventional treatments against this strain are the challenges of the coming decades. New therapeutic techniques aim to confirm cure without deterioration, to reduce deaths, contagions and the formation of drug-resistant strains. A plethora of new diagnostic tests are available to diagnose the active tuberculosis, screen latent *M. tuberculosis* infection, and to identify drug-resistant strains of *M. tuberculosis*. When effective prevention strategies do not prevail, high rates of early case detection and successive cures to control TB emergence would not be possible. In this review, we discussed the structural features of *M. tuberculosis*, Multi drug resistance tuberculosis (MDR-TB), extremely drug-resistant tuberculosis (XDR-TB), the mechanism of *M. tuberculosis* infection, the mode of action of first and second-line antitubercular drugs, the

16. Kumari P, Kumari N, Mohan C, Chinglenthoiba C & Amesho KTT

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International Journal of Biological Macromolecules

Volume 257, Part 1, February 2024, 128278

Environmentally benign approach to formulate nanoclay/starch hydrogel for controlled release of zinc and its application in seed coating of *Oryza Sativa* plant

Priyanka Kumari [a], Neeraj Kumari [b], Chandra Mohan [b] ✉, Chingakham Chinglenthoiba [c], Kassian T.T. Amesho [d e f g] ✉

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Abstract

Improper use of conventional fertilizers has been linked to adverse effects on soil nutrient levels. To mitigate the negative impact of surface feeding fertilizers and reduce environmental pollution, a new type of seed coating material has been developed to

17. Adhaduk K, **Yadav S** & Kumar D

Effect of B□N substitution on structure, reactivity and spectroscopic properties of polyarylenevinylene systems: A computational insight

Krishna Adhaduk, Sunil Yadav, Deepak Kumar

Physical and Theoretical Chemistry | Condensed Matter Physics | Atomic and Molecular Physics, and Optics

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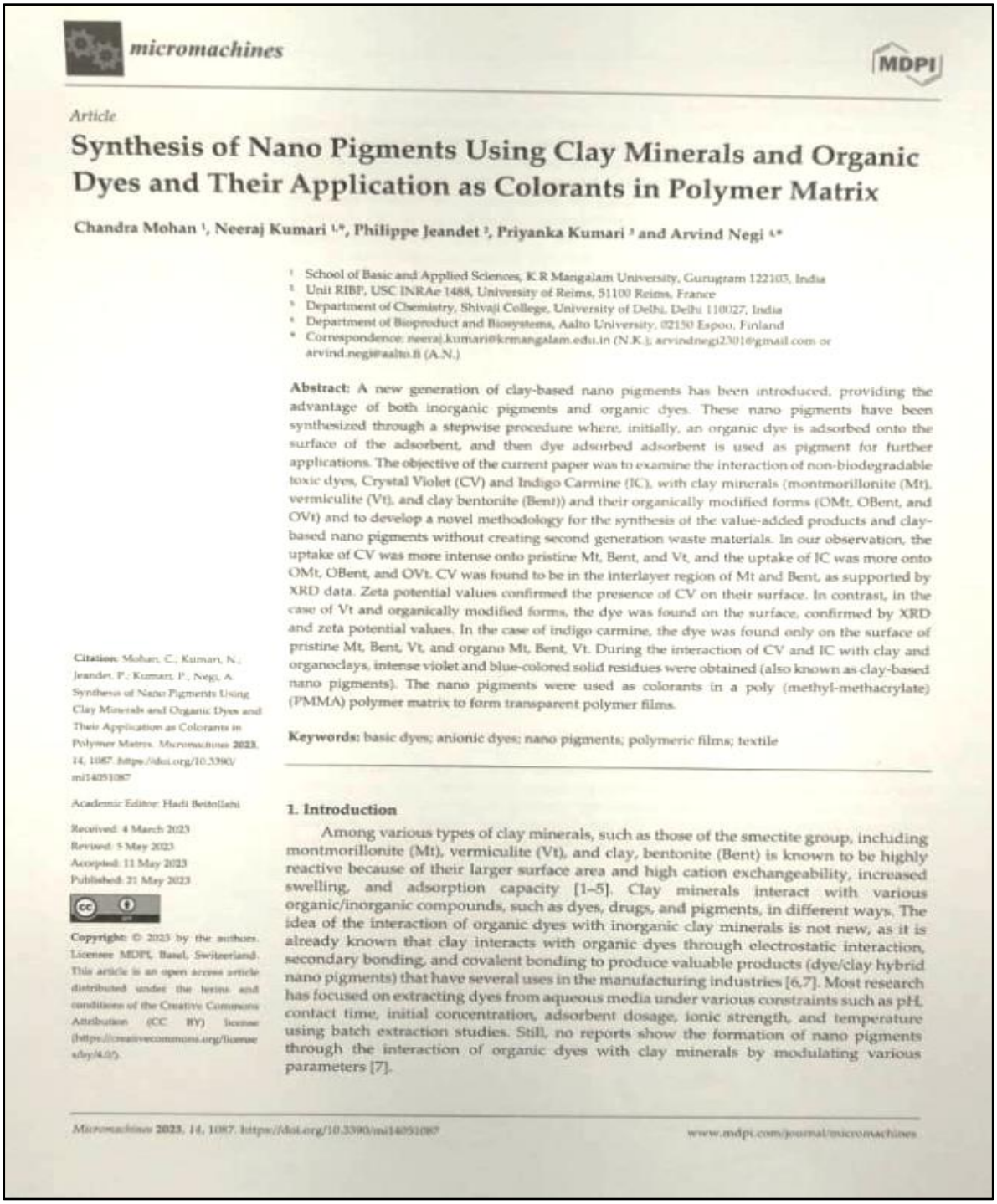
Abstract

Linearly conjugated systems in organic chemistry reveal the intriguing relationship between structure and electronic properties. Such systems, characterized by alternating single and multiple bonds, possess unique electronic traits with practical applications in organic electronics. Carbon-bridged oligophenylenevinyles (COPVs) are promising candidates for enhanced charge transport. However, their synthesis efficiency poses challenges. Heteroatom substitution, particularly B□N

18. Mohan C, Kumari N, Jeandet P, **Kumari P** & Negi A



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Article

Synthesis of Nano Pigments Using Clay Minerals and Organic Dyes and Their Application as Colorants in Polymer Matrix

Chandra Mohan [1], Neeraj Kumari [1,*], Philippe Jeandet [2], Priyanka Kumari [3] and Arvind Negi [4,*]

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Abstract: A new generation of clay-based nano pigments has been introduced, providing the advantage of both inorganic pigments and organic dyes. These nano pigments have been synthesized through a stepwise procedure where, initially, an organic dye is adsorbed onto the surface of the adsorbent, and then dye adsorbed adsorbent is used as pigment for further applications. The objective of the current paper was to examine the interaction of non-biodegradable toxic dyes, Crystal Violet (CV) and Indigo Carmine (IC), with clay minerals (montmorillonite (Mt), vermiculite (Vt), and clay bentonite (Bent)) and their organically modified forms (OMt, OBent, and OVt) and to develop a novel methodology for the synthesis of the value-added products and clay-based nano pigments without creating second generation waste materials. In our observation, the uptake of CV was more intense onto pristine Mt, Bent, and Vt, and the uptake of IC was more onto OMt, OBent, and OVt. CV was found to be in the interlayer region of Mt and Bent, as supported by XRD data. Zeta potential values confirmed the presence of CV on their surface. In contrast, in the case of Vt and organically modified forms, the dye was found on the surface, confirmed by XRD and zeta potential values. In the case of indigo carmine, the dye was found only on the surface of pristine Mt, Bent, Vt, and organo Mt, Bent, Vt. During the interaction of CV and IC with clay and organoclays, intense violet and blue-colored solid residues were obtained (also known as clay-based nano pigments). The nano pigments were used as colorants in a poly (methyl-methacrylate) (PMMA) polymer matrix to form transparent polymer films.

Keywords: basic dyes; anionic dyes; nano pigments; polymeric films; textile

Citation: Mohan, C.; Kumari, N.; Jeandet, P.; Kumari, P.; Negi, A. Synthesis of Nano Pigments Using Clay Minerals and Organic Dyes and Their Application as Colorants in Polymer Matrix. *Micromachines* **2023**, *14*, 1087. https://doi.org/10.3390/mi14051087

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1. Introduction

Among various types of clay minerals, such as those of the smectite group, including montmorillonite (Mt), vermiculite (Vt), and clay, bentonite (Bent) is known to be highly reactive because of their larger surface area and high cation exchangeability, increased swelling, and adsorption capacity [1–5]. Clay minerals interact with various organic/inorganic compounds, such as dyes, drugs, and pigments, in different ways. The idea of the interaction of organic dyes with inorganic clay minerals is not new, as it is already known that clay interacts with organic dyes through electrostatic interaction, secondary bonding, and covalent bonding to produce valuable products (dye/clay hybrid nano pigments) that have several uses in the manufacturing industries [6,7]. Most research has focused on extracting dyes from aqueous media under various constraints such as pH, contact time, initial concentration, adsorbent dosage, ionic strength, and temperature using batch extraction studies. Still, no reports show the formation of nano pigments through the interaction of organic dyes with clay minerals by modulating various parameters [7].

19. Ghatak T, Shah C, Althagafi I, **Giri NG**, Nath M & Pratapa M.

ROYAL SOCIETY OF CHEMISTRY

Organic & Biomolecular Chemistry

Volume 22, Issue 9, 28 February 2024, Pages 1859-1870

Iodine/DMSO-mediated one-pot access towards 1-aryl-2-(pyrazol-5-yl)ethane-1,2-diones *via* a domino reaction from functionalized pent-2-ene-1,5-diones †

Trisha Ghatak [a], Chandan Shah [a], Ismail Althagafi [b], Nand Gopal Giri [c], Mahendra Nath [a], Ramendra Pratap [a] ✉

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https://doi.org/10.1039/d3ob01997g

A facile one-pot cascade synthesis involving simultaneous *in situ* pyrazole

20. . **Kumari P**, Kumari N & Mohan C

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Augmenting barrier efficiency in clay-based starch composite films for enhanced packaging sustainability

Priyanka Kumari, Neeraj Kumari, Chandra Mohan, Mysoon M. Al-Ansari, Saurav Dixit

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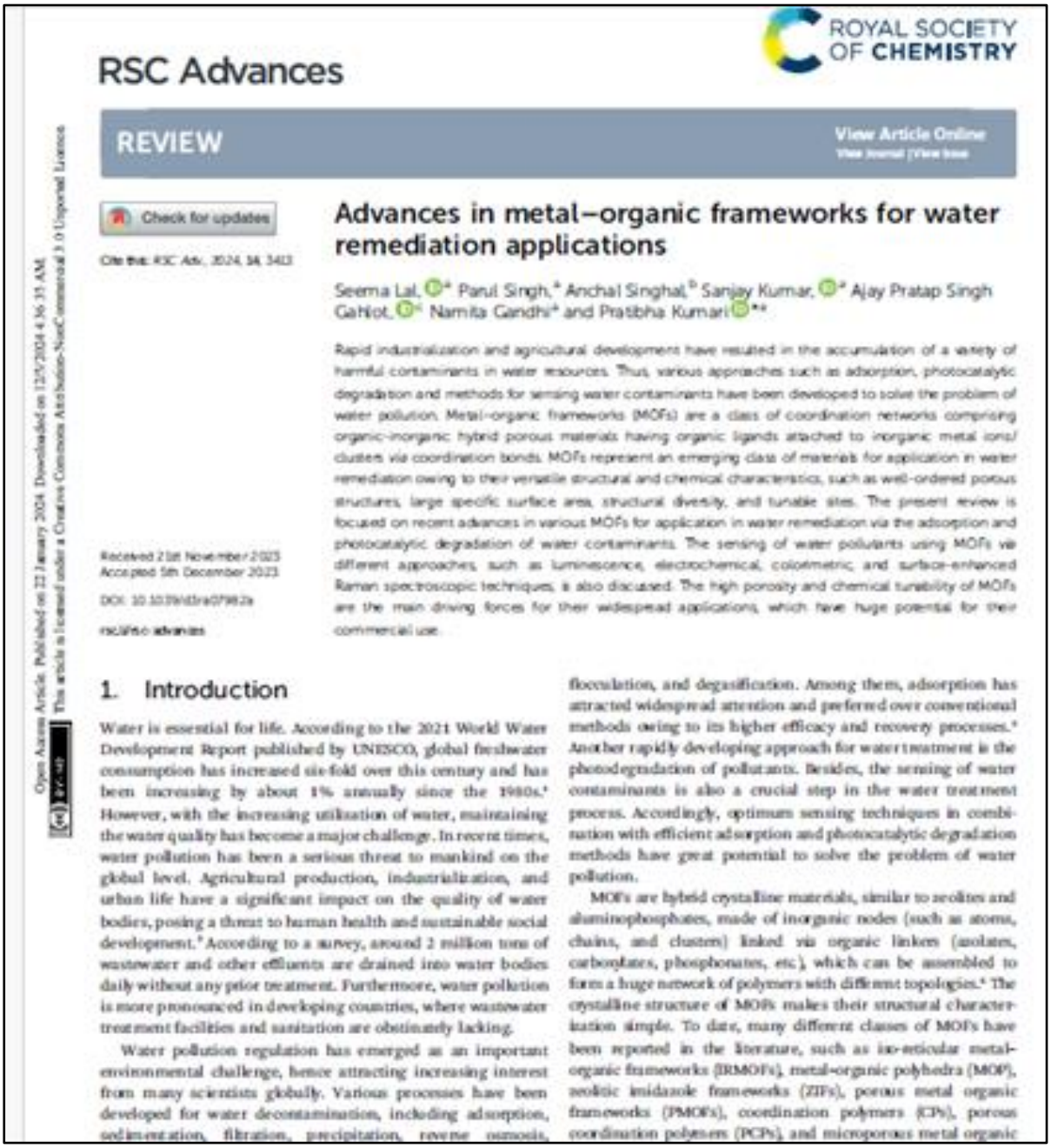
Abstract

The pervasive utilization of plastic as a cost-effective packaging material for food has led to environmental concerns, primarily due to its non-biodegradable nature and the ensuing release of carbon dioxide gas that contributes to global warming. In response to these challenges, researchers have shifted their focus toward biopolymers to develop eco-friendly packaging solutions. The present study introduces a novel approach to study the release of micronutrient (Fe) from clay free starch-glycerol film and clay-starch-glycerol composite film. The structural composition and characteristics of the synthesized film are meticulously examined using x-ray diffraction (XRD), ATR, scanning electron

21. . Lal S, Singh P, Singhal A, Kumar A, Gahlot AP & **Kumari P**



ROYAL SOCIETY OF CHEMISTRY

RSC Advances

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Advances in metal–organic frameworks for water remediation applications

Seema Lal,[a] Parul Singh,[a] Anchal Singhal,[b] Sanjay Kumar,[a] Ajay Pratap Singh Gahlot,[c] Namita Gandhi[a] and Pratibha Kumari[a]*

Rapid industrialization and agricultural development have resulted in the accumulation of a variety of harmful contaminants in water resources. Thus, various approaches such as adsorption, photocatalytic degradation and methods for sensing water contaminants have been developed to solve the problem of water pollution. Metal–organic frameworks (MOFs) are a class of coordination networks comprising organic–inorganic hybrid porous materials having organic ligands attached to inorganic metal ions/clusters via coordination bonds. MOFs represent an emerging class of materials for application in water remediation owing to their versatile structural and chemical characteristics, such as well-ordered porous structures, large specific surface area, structural diversity, and tunable sites. The present review is focused on recent advances in various MOFs for application in water remediation via the adsorption and photocatalytic degradation of water contaminants. The sensing of water pollutants using MOFs via different approaches, such as luminescence, electrochemical, colorimetric, and surface-enhanced Raman spectroscopic techniques, is also discussed. The high porosity and chemical tunability of MOFs are the main driving forces for their widespread applications, which have huge potential for their commercial use.

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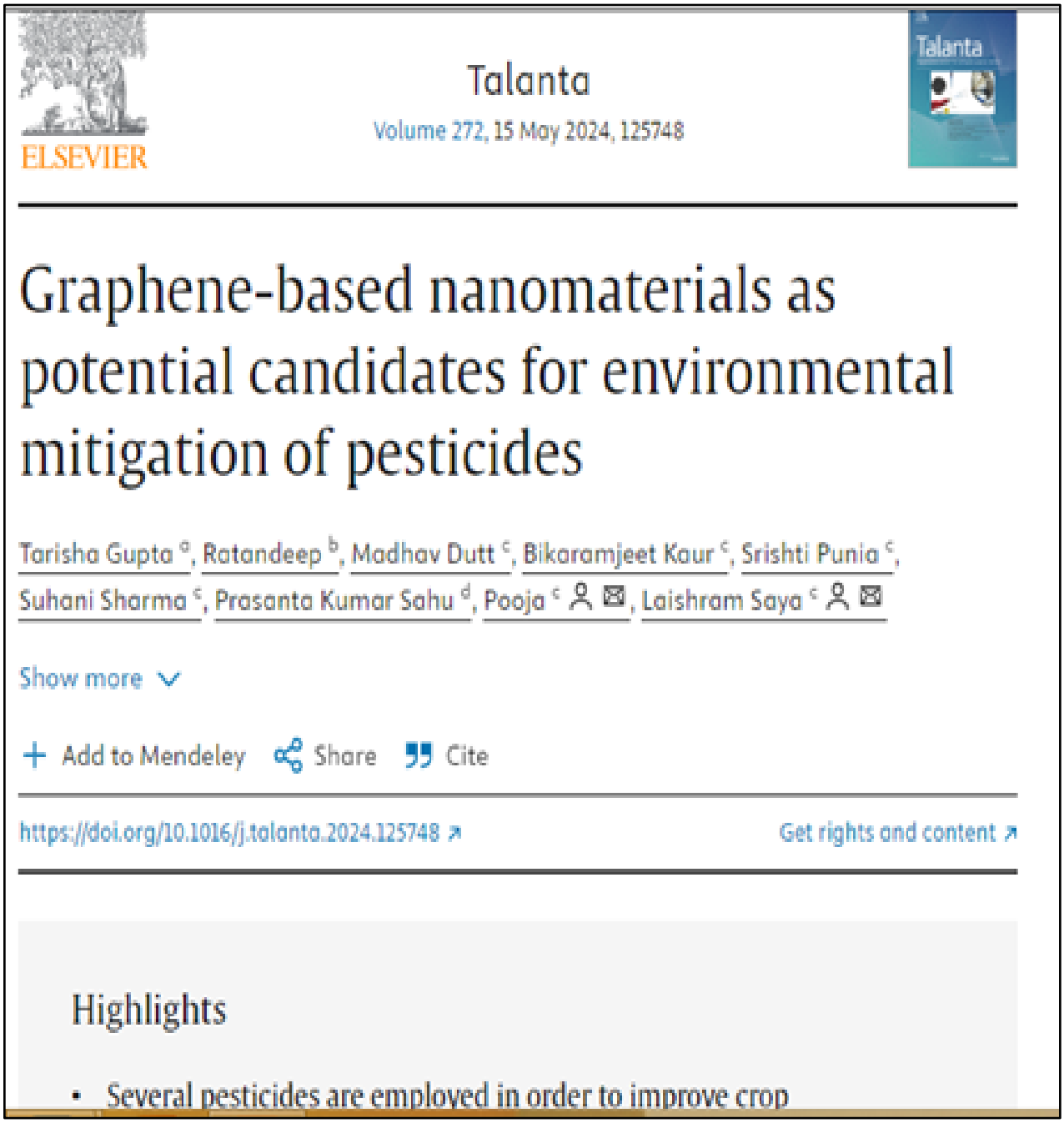
1. Introduction

Water is essential for life. According to the 2021 World Water Development Report published by UNESCO, global freshwater consumption has increased six-fold over this century and has been increasing by about 1% annually since the 1980s.[1] However, with the increasing utilization of water, maintaining the water quality has become a major challenge. In recent times, water pollution has been a serious threat to mankind on the global level. Agricultural production, industrialization, and urban life have a significant impact on the quality of water bodies, posing a threat to human health and sustainable social development.[2] According to a survey, around 2 million tons of wastewater and other effluents are drained into water bodies daily without any prior treatment. Furthermore, water pollution is more pronounced in developing countries, where wastewater treatment facilities and sanitation are obstinately lacking.

Water pollution regulation has emerged as an important environmental challenge, hence attracting increasing interest from many scientists globally. Various processes have been developed for water decontamination, including adsorption, sedimentation, filtration, precipitation, reverse osmosis, flocculation, and degasification. Among them, adsorption has attracted widespread attention and preferred over conventional methods owing to its higher efficacy and recovery processes.[3] Another rapidly developing approach for water treatment is the photodegradation of pollutants. Besides, the sensing of water contaminants is also a crucial step in the water treatment process. Accordingly, optimum sensing techniques in combination with efficient adsorption and photocatalytic degradation methods have great potential to solve the problem of water pollution.

MOFs are hybrid crystalline materials, similar to zeolites and aluminophosphates, made of inorganic nodes (such as atoms, chains, and clusters) linked via organic linkers (anolates, carboxylates, phosphonates, etc.), which can be assembled to form a huge network of polymers with different topologies.[4] The crystalline structure of MOFs makes their structural characterization simple. To date, many different classes of MOFs have been reported in the literature, such as iso-reticular metal-organic frameworks (IRMOFs), metal-organic polyhedra (MOP), zeolitic imidazole frameworks (ZIFs), porous metal organic frameworks (PMOFs), coordination polymers (CPs), porous coordination polymers (PCPs), and microporous metal organic

22. Gupta T, Ratandeep, Dutt M, Kaur B, Punia S, Sharma S, **Sahu PK**, Pooja & Saya L



ELSEVIER

Talanta

Volume 272, 15 May 2024, 125748

Graphene-based nanomaterials as potential candidates for environmental mitigation of pesticides

Tarisha Gupta [a], Ratandeep [b], Madhav Dutt [c], Bikaramjeet Kaur [c], Srishti Punia [c], Suhani Sharma [c], Prasanta Kumar Sahu [d], Pooja [c] ✉, Laishram Saya [c] ✉

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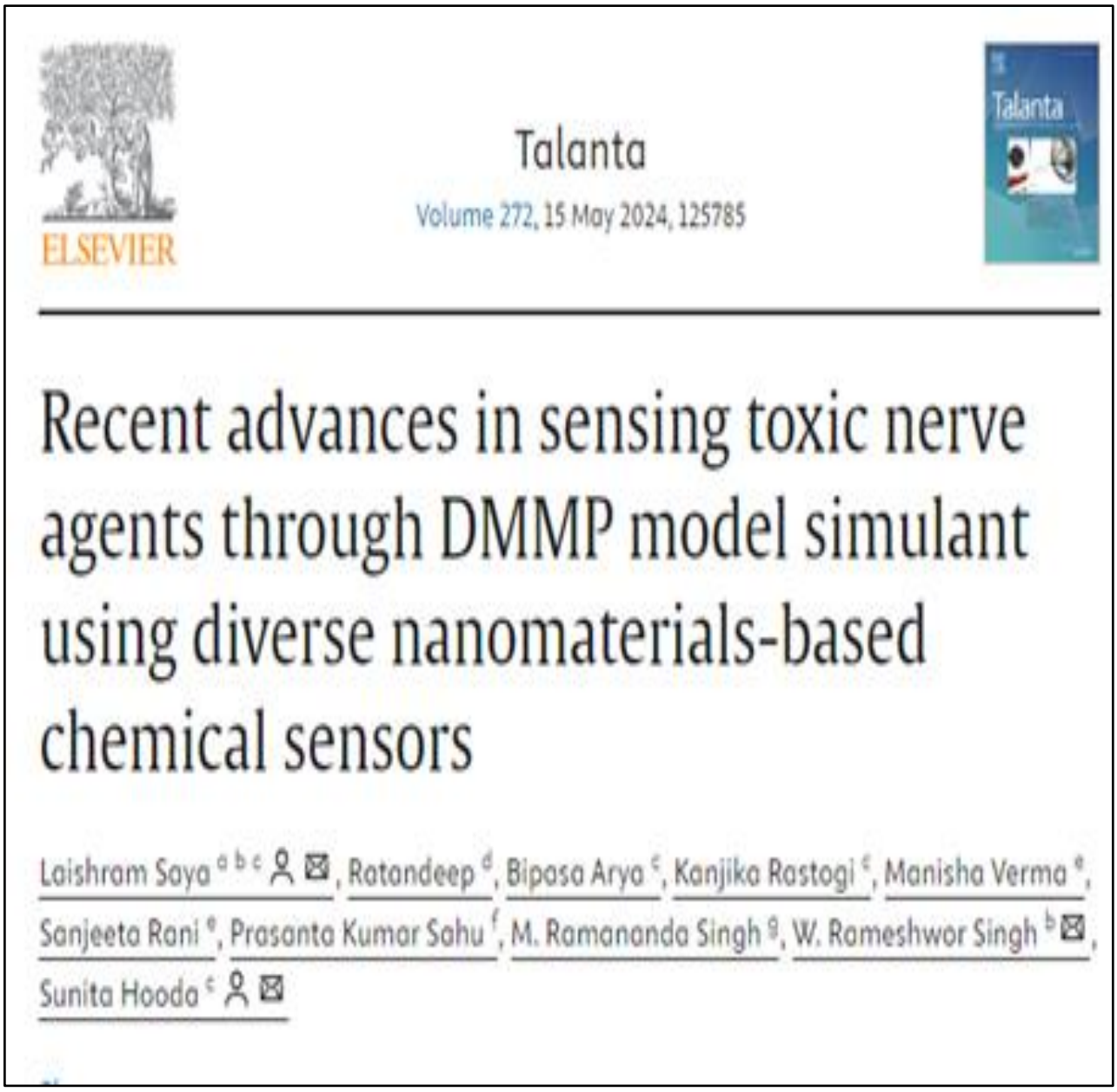
Highlights

- Several pesticides are employed in order to improve crop

23. Saya L, Ratandeep, Arya B, Rastogi K, Verma M, Rani S, **Sahu PK**, Singh MR, Singh WR & Hooda S



ELSEVIER

Talanta

Volume 272, 15 May 2024, 125785

Recent advances in sensing toxic nerve agents through DMMP model simulant using diverse nanomaterials-based chemical sensors

Laishram Saya [a b c], Ratandeep [d], Bipasa Arya [c], Kanjika Rastogi [c], Manisha Verma [e], Sanjeeta Rani [e], Prasanta Kumar Sahu [f], M. Ramananda Singh [g], W. Rameshwor Singh [b], Sunita Hooda [c]

24. Singh D, Anuradha, Kumar S, Kumar A, Dheer N, Singh MR, **KanojiaR** etal.

Applied Chemical Engineering (2023) Volume 6 Issue 1
doi:10.24294/ace.v6i1.1998

ORIGINAL RESEARCH ARTICLE

Photodegradation of Methylene blue and Rhodamine B using potato starch mediated zinc oxide nanoparticles and its calcium nanocomposites: Greener approach

Darshan Singh[1*], Anuradha[1], Surendra Kumar[2], Amar Kumar[3], Neelu Dheer[4], M. Ramananda Singh[5], Rajni Kanojia[6], Sangeeta Kaul[7], Ishwar Prasad Sahu[8]

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ABSTRACT

Zinc oxide is considered an effective photocatalyst for degradation of several organic contaminants found in wastewater. This work reports the biological synthesis of zinc oxide nanoparticles and its calcium nanocomposites to study the photocatalytic deterioration of two dyes, viz. Rhodamine B and Methylene blue, under natural sunlight. Nanoparticles were synthesized using zinc acetate and starch extracted from potato at pH 7–8. Potato starch acts as both a capping agent and a reducing agent. They were characterized spectroscopically via XRD, SEM, HR-TEM, EDAX and FT-IR techniques. Bean/spherical shaped ZnO NPs were obtained in the size range of 29–49 nm whereas calcium coating on ZnO decreased the particle size, i.e., 25–35 nm. Their photocatalytic ability to degrade Rhodamine B and Methylene blue was studied under natural sunlight and monitored using UV-Vis spectrophotometer. Synthesized ZnO nanoparticles and its calcium coated ZnO nanocomposites showed promising results in degradation of these dyes. Methylene blue was completely degraded in an hour at 5 mg of the sample. Although degradation of Rhodamine dye was slow, synthesized samples were effective catalysts as compared to the ones reported in the literature.

Keywords: ZnO NPs; Ca-ZnO Nanocomposites; Potato Starch; Methylene Blue; Rhodamine B

25. Dheer N, Kalra AK, Singh D, Ujjain SK, Ahuja P, Kumar R, Singh P, Johar NK, Singh MR & **Kanojia R**

INTERNATIONAL JOURNAL OF CORROSION AND SCALE INHIBITION

ISSN 2305-6894

Mild steel corrosion inhibition by nicotinamide as a green inhibitor: An electrochemical, thermodynamic and theoretical insight

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7Maharaja Agrasen Institute of Technology, Delhi, India
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[8] Kirori Mal College, University of Delhi, Delhi, 110007, India
[9] Shivaji College, University of Delhi, Delhi, 110027, India

26. Devi PS, Kant A, goijon P, Ghosh S, Dheer N, **Kanojia R**, Singh P& Singh MR

Elsholtzia Griffithii as an eco-friendly anticorrosive inhibitor of Mild Steel under Acid Medium

Pebam Sanjeeta Devi [a] ✉, Arun Kant [a], Panmei Gaijon [a], Sudipta Ghosh [a], Neelu Dheer [b], Rajni Kanojia [c], Prashant Singh [d], M. Ramananda Singh [a] ✉

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Highlights

- Corrosion inhibitor material was successfully extracted from Elsholtzia Griffithii.
- The extract was characterized by FTIR and UV-VIS

27. Singh D,Anuradha, Mathur D, Kumar S, Pani B, Kumar A, **Kanojia R,** Gupta R & Singh L

Contents lists available at ScienceDirect

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Bio-genic synthesis of calcium coated zinc oxide nanoparticles from *beetroot extract* and their photo-degradation study on methylene blue and rhodamine B

Darshan Singh[a,*], Anuradha[a], Divya Mathur[a], Surendra Kumar[b], Balaram Pani[c], Amar Kumar[d], Rajni Kanojia[e], Ravi Gupta[f,*], Laxman Singh[g,*]

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[c] Department of Chemistry, Bhaskaracharya College of Applied Sciences, University of Delhi, 110075, India
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[g] Department of Chemistry, Siddhartha University, Kapilvastu, Siddharth Nagar, 272202, India

ARTICLE INFO

Keywords:
Beet root extract
Zinc oxide
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Rhodamine B
Methylene blue
Degradation

ABSTRACT

The advent of nanotechnology has helped in several invention in science & technology. Contamination of surface water, ground and soil by various industrial dyes causes several ecological problems. Zinc oxide nanoparticles as photocatalysts and semiconductor materials show unique physical properties at the nanoscale and can be used to solve these problems to some extent. In this paper, we synthesized ZnO NPs and calcium-coated ZnO nanoparticles using extract of beetroot and then, for industrial point of view, we studied the photocatalytic degradation of methylene blue and rhodamine B using sun as a natural light source (sunlight). We have synthesized calcium-coated ZnO nanocomposites with 20–50 nm particle size. Synthesized nanomaterials were characterized by using the different physio-chemical techniques such as - FT-IR, XRD, TEM, SEM, EDX and UV-spectrophotometer do their photocatalytic degradation.

1. Introduction

Photocatalyst" is derived from two words "photo," which means light, & "catalyst" which is chemical agent that fastens the chemical

28. Dheer N, Kalra AK, Singh D, Ujjain SK, Ahuja P, Singh G, Singh MR & **Kanojia R**

Synergistic Inhibition Effect of 3-Carboxypyridine and Potassium Iodide on Mild Steel Corrosion in H_2SO_4: Electrochemical and Surface Analyses

Neelu Dheer[1], Amarpreet K. Kalra[2], Darshan Singh[3], Sanjeev Kumar Ujjain[4], Preety Ahuja[4], Gurmeet Singh[5], M. Ramananda Singh[6*] and Rajni Kanojia[7*]

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Abstract
The effective inhibition of MS corrosion in H_2SO_4 by CP and CP + KI was assessed by EIS. SM of MS was studied using SEM and AFM. The rise in R_{ct} and decrease in C_{dl} with higher C of CP and CP + KI, confirmed MS CI. IE(%) increased with higher C of CP only and CP + KI (from 10^{-3} to 10^{-1} M). CP maximum IE(%) was 93.9%, at 10^{-1} M. CP + KI, due to I^- ions synergistic effect, showed an IE(%) of about 98.8%, at 10^{-1} M. CP only and CP + KI adsorption mechanism followed Langmuir's isotherm. SM studies suggested that a barrier film of CP only and CP + KI, mitigated MS surface corrosion. CP + KI is an efficient inhibitor in H_2SO_4.

Keywords: AFM; corrosion; CP; EIS; IE(%); KI; MS; SM; SEM.

Introduction*

Metallic corrosion is affected by environmental factors (including moisture and T) and surface conditions, such as energy, exposed area, roughness and oxides stability, which are inherently related to the materials composition. Unanticipated failures (stream generator and pipeline stress corrosion cracking) and system shutdowns occur in oil and gas industries, at pipelines, liquefied natural gas terminals and refineries, due to corrosion, which results in monetary losses. When analyzing any method to control corrosion in industrial systems, operational processes should

29. Maurya S & **Singh R**

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ISSN (Online) : 2581-8104

Evaluation of Sustainability Reporting Practices in Indian Banks – A Content Analysis Approach

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Abstract

In present times to achieve sustainable development, business organisations are required to disclose their socio-environmental contribution along with their financial results and to incorporate sustainability into their business practices. This paper with the help of content analysis seeks to analyse the sustainability disclosures of selected Indian banks listed on BSE for the year 2019-20. It further examines any significant difference in the sustainability disclosure of selected banks based on their sustainability disclosure according to the Global Reporting Initiatives (GRI) framework, foreign market presence and ownership pattern. As per the results of content analysis, the study finds that Sustainability Reporting (SR) is lowest for the 'Environment' dimension followed by 'Human Rights and Labour Practices' while reporting under the 'Governance' dimension is highest. The 'Social' dimension is also fairly reported by the sample banks. The results of Mann Whitney U test indicate that sustainability disclosure is significantly different among selected banks based on the adoption of the GRI framework for sustainability reporting and no difference in SR is found based on ownership pattern and foreign market presence.

Keywords: Banking Companies, Content Analysis, India, Sustainable Development, Sustainability Reporting
JEL Classification: : G21, M140, Q01

30. Verma A, Singh G & **Malik R**

Journal of Research Administration
Society of Research Administrators International

A STUDY ON THE CHANGING CUSTOMER ATTITUDE AND BEHAVIOR TOWARDS DIGITAL FOOD APP SERVICES WITH SPECIAL REFERENCE TO LUCKNOW DISTRICT

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Abstract

In today's world service sector contributes 64.80% in GDP.The rise of digital technology is reshaping the industries. With the increased use of technology, the number of people engaging into the digital sector is rapidly increasing. Even consumers are accustomed to shopping or even ordering online through apps or websites, with maximum convenience and transparency, expecting the same experience that they would get from outlet itself. To match up with the consumer's expectations apps are providing increased facilities and services to the consumers. This scenario doesn't exist only in one country but all across the globe.

With the entire boom in digital industry across the globe, it's had its impact on the Indian economy too. The online food ordering firms have sprouted in bulk. The market size of food in India is expected to reach Rs.42 lakh crore by 2020,reports BCG. Presently the Indian food market is

31. Sharma N. & **Samantara R.**

MAXIMISING ORGANISATIONAL OUTCOMES: THE ESSENTIALITY OF INDIVIDUAL SPIRITUALITY

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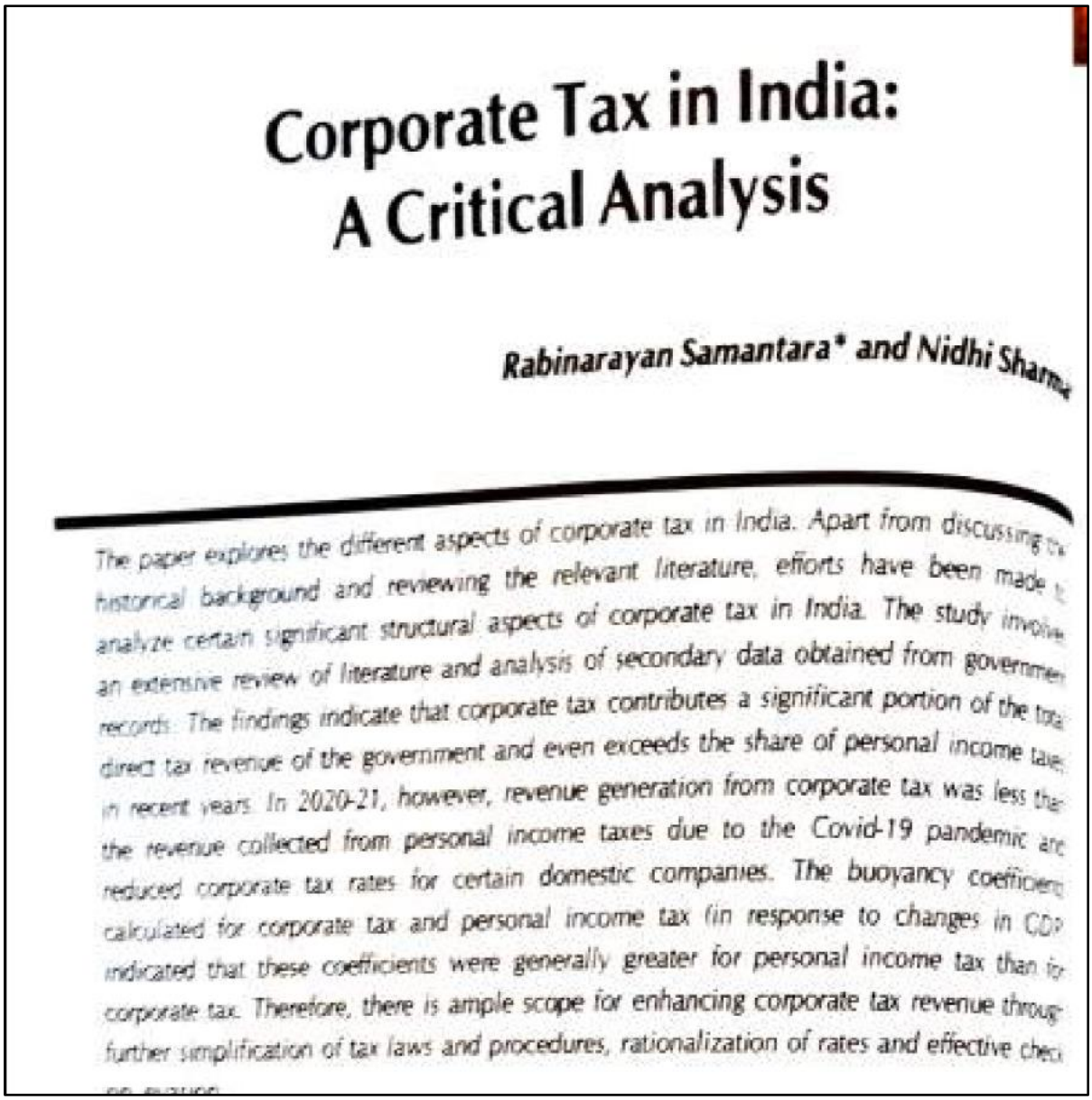
Abstract
There has been extensive research on workplace spirituality and its impact on several organisational outcomes. Research scholars have, however, emphasised upon the importance of workplace spirituality in organisations, almost to the exclusion of individual spirituality which is considered equally valuable from the viewpoint of maximising organisational outcomes or values. In view of this, the present paper not only attempts to examine the positive effects of workplace spirituality but also analyses research evidences regarding the criticality of individual spirituality in the context of workplace spirituality. As shown by the findings of both theoretical and empirical research studies, there is a strong positive association between workplace spirituality and several organisational outcomes such as employee engagement, team effectiveness, human resource development, customer orientation, ethical behaviour, strategic decision-making, work commitment, job satisfaction, etc. The research evidences obtained further suggest that the positive effects of workplace spirituality on organisational values get reduced in the absence of individual spirituality. Therefore, the authors have strongly advocated the essentiality of individual spirituality or its coexistence with workplace spirituality in order to maximise organisational values or outcomes. In the end, efforts have been made to pinpoint certain important areas pertaining to this subject of enquiry for further research.

Key words: Individual Spirituality, Workplace spirituality, Organisational outcomes, Systematic review, Personal values.

32. Samantara R & Sharma N.



Corporate Tax in India: A Critical Analysis

Rabinarayan Samantara* and Nidhi Sharma

The paper explores the different aspects of corporate tax in India. Apart from discussing the historical background and reviewing the relevant literature, efforts have been made to analyze certain significant structural aspects of corporate tax in India. The study involves an extensive review of literature and analysis of secondary data obtained from government records. The findings indicate that corporate tax contributes a significant portion of the total direct tax revenue of the government and even exceeds the share of personal income taxes in recent years. In 2020-21, however, revenue generation from corporate tax was less than the revenue collected from personal income taxes due to the Covid-19 pandemic and reduced corporate tax rates for certain domestic companies. The buoyancy coefficients calculated for corporate tax and personal income tax (in response to changes in GDP) indicated that these coefficients were generally greater for personal income tax than for corporate tax. Therefore, there is ample scope for enhancing corporate tax revenue through further simplification of tax laws and procedures, rationalization of rates and effective check

33. Kharbanda S, Sharma K & Singh NP

Green Purchase Intention and Role of Trust: A Study of Indian Consumers

Suman Kharbanda, Kavita Sharma** and N P Singh****

Transitioning from consumption of conventional to eco-friendly products is very rarely a spontaneous decision for consumers. To do so, the consumers need to have enough trust in the 'greenness' of the product and in the claims of manufacturers, as they cannot verify them even after consuming the product. The findings of this study, based on a survey in India, revealed that consumer trust acts as a mediator between awareness of green products and purchase intention. Further, trust also plays a moderating role in the relationship between concern for the environment and purchase behavior of consumers. As the world is striving hard to attain the UN Sustainable Development Goals, this study has practical implications for marketers and policymakers who build strategies and appeals to promote sustainable and responsible consumption.

Introduction

The goal of achieving sustainable growth of a nation encompasses in itself the accomplishment of economic, financial, social and environmental goals. While all other goals have always been the focus of governments, achieving environmental sustainability is now gaining attention worldwide, given the immense damage caused by economic activities of production and consumption. Environmental sustainability can be achieved by making all the concerned stakeholders aligned to a common goal, by making sure that they have a conviction to keep the environment safe and preserved, not only for themselves but also for future generations. While manufacturers can produce eco-friendly products by using techniques that ensure a stable environment for future generations (Sharma *et al*., 2022), consumers can be environmentally responsible by being conscious of their consumption.

The acceptance of green products, in general, is influenced by several economic and psychographic factors listed by various researchers (Wijekoon and Sabri, 2021; Joshi and Rahman, 2015; and Zhang and Dong, 2020). However, an important factor that

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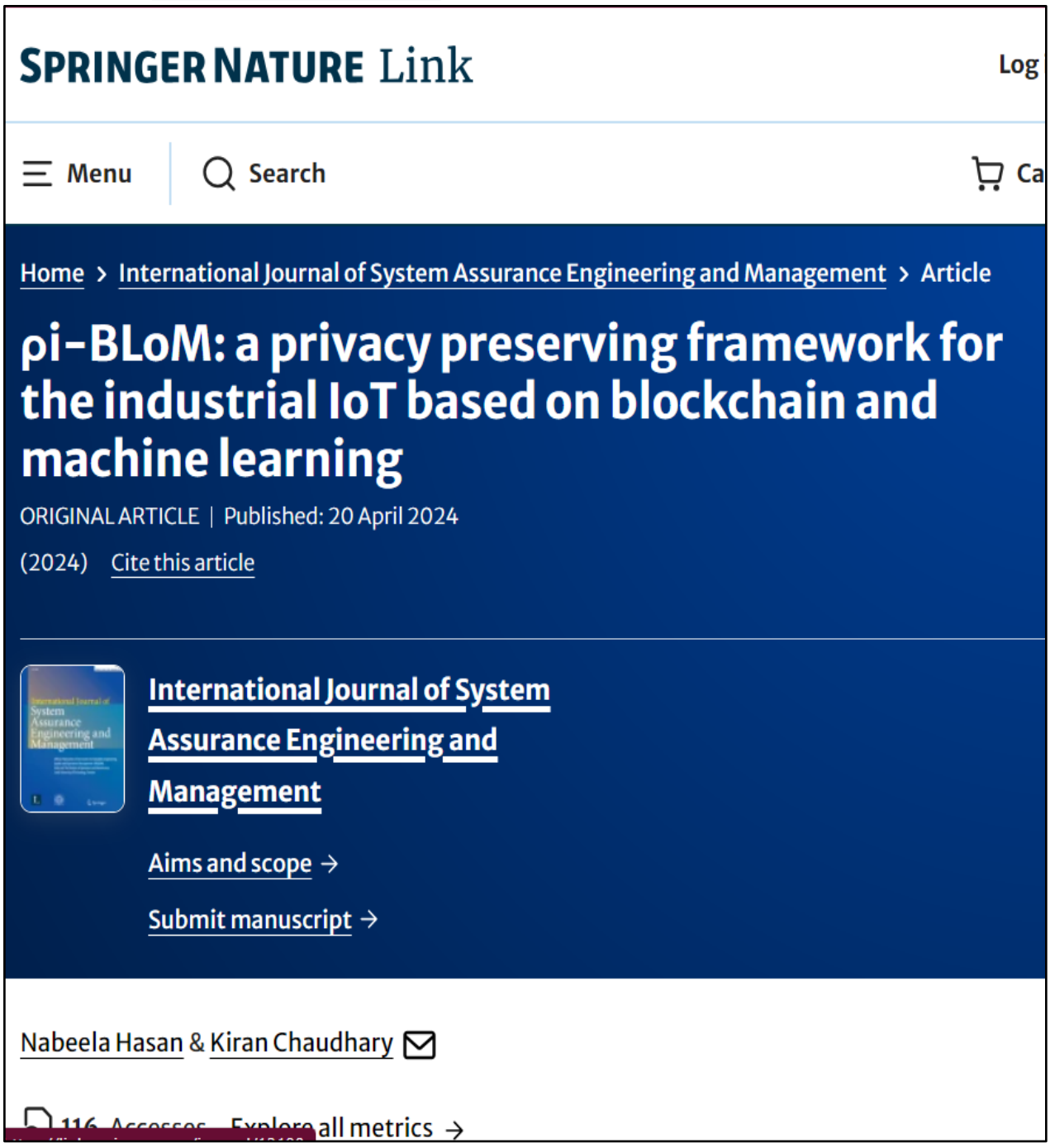
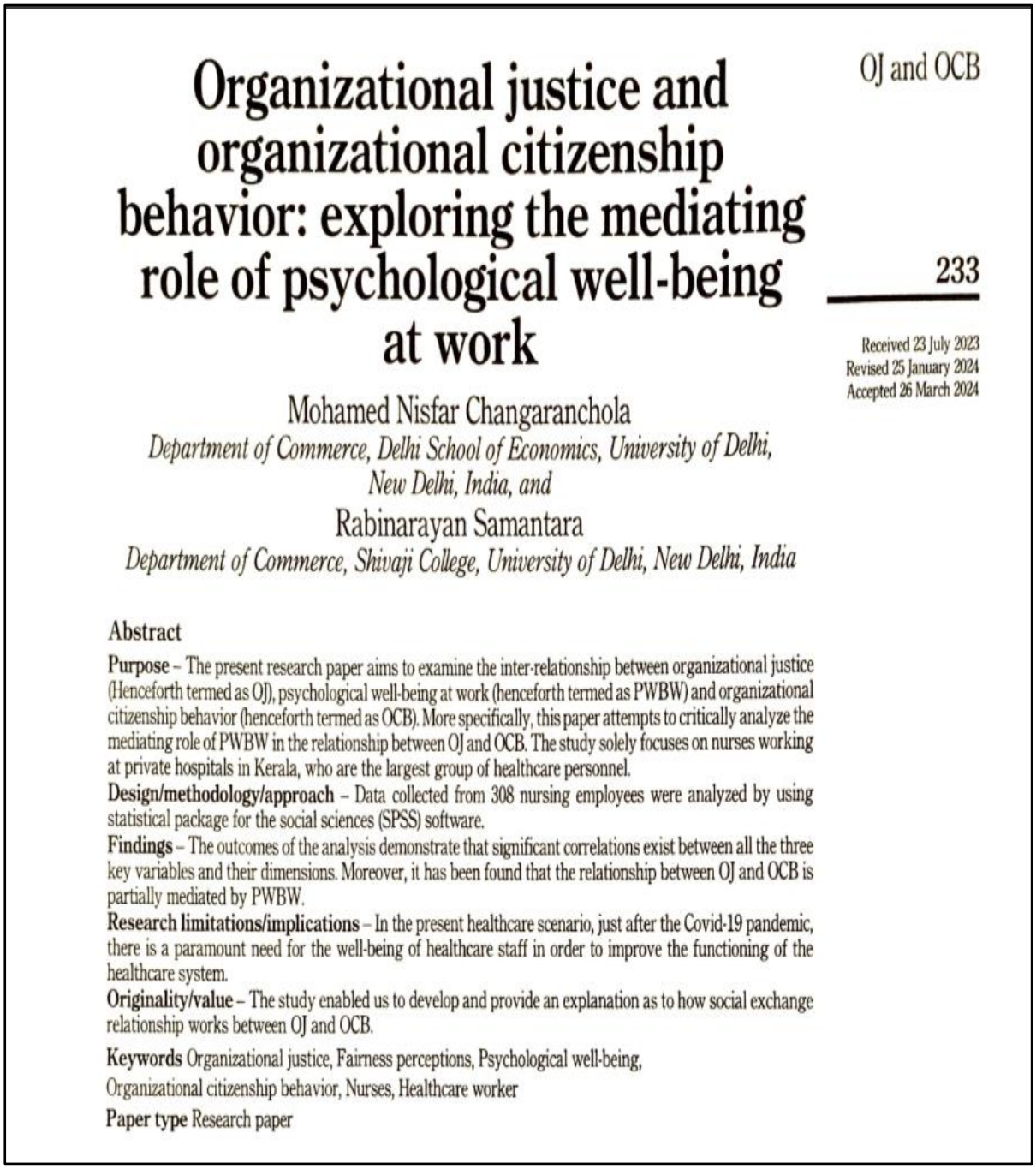
34. Hasan N & **Chaudhary K.**



35. Changaranchola MN & **Samantara R**



Organizational justice and organizational citizenship behavior: exploring the mediating role of psychological well-being at work

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Abstract

Purpose – The present research paper aims to examine the inter-relationship between organizational justice (Henceforth termed as OJ), psychological well-being at work (henceforth termed as PWBW) and organizational citizenship behavior (henceforth termed as OCB). More specifically, this paper attempts to critically analyze the mediating role of PWBW in the relationship between OJ and OCB. The study solely focuses on nurses working at private hospitals in Kerala, who are the largest group of healthcare personnel.

Design/methodology/approach – Data collected from 308 nursing employees were analyzed by using statistical package for the social sciences (SPSS) software.

Findings – The outcomes of the analysis demonstrate that significant correlations exist between all the three key variables and their dimensions. Moreover, it has been found that the relationship between OJ and OCB is partially mediated by PWBW.

Research limitations/implications – In the present healthcare scenario, just after the Covid-19 pandemic, there is a paramount need for the well-being of healthcare staff in order to improve the functioning of the healthcare system.

Originality/value – The study enabled us to develop and provide an explanation as to how social exchange relationship works between OJ and OCB.

Keywords Organizational justice, Fairness perceptions, Psychological well-being, Organizational citizenship behavior, Nurses, Healthcare worker

Paper type Research paper

36. Hangzo S.

Scripting a New Paite Narrativity: From a Word to the Web

Siamlianvung Hangzo*

["Scripting a New Paite Narrativity: From a Word to the Web" examines how online platforms enabled a new narrativity in Paite writings at the turn of the 21st century. Scholasticism emerged among the Paite tribe of Manipur after conversion to Christianity. The evangelical genesis of literacy ensured that much of Paite literature has remained largely scriptural. This paper studies how the Paite urban middle class have employed the Internet as a thematically unrestricted platform to write, popularise and disseminate non-liturgical writings.]

The primary data for this paper has been drawn from three community online portals namely, zogam.com, zogamonline.com and phualvatimes.com which were active from 2003. These portals initially collated news that concerned the Paite people to provide instant information for those living outside the home state of Manipur. More significantly, these portals provided space for vernacular fiction writings bypassing the financial encumbrance of printing and thematic control of the Church.

The Paite community's initiation into scholasticism begins with conversion to Christianity in 1910. The Western missionaries introduced a codified writing system based on the Roman script and established the first schools in the Paite-inhabited areas.[1] Neglected by the colonial government, these schools were much sought after. The early converts went on to become evangelist teachers in these mission schools. The first phase of writing in Paite was naturally spearheaded by mission teachers and their literary output, from the 1940s onwards, were translations of the Bible and hymnals. In 1963, the Printing Press Committee of the Evangelical Baptist Convention Church (the largest denomination among the Paite) purchased a second-hand printing press which ushered in a new era of print literature.[2] So, from the incipient stage and even today, Paite writings remain predominantly scriptural in nature.

Terje Rasmussen in his essay *Internet and the Political Public Sphere* opines that the conventional mode of mass communication operated on the principle of "minority of speakers and majority of listeners." This, he argues was because the "one-way, mass oriented technologies of print and broadcasting enabled this division, which in many ways contradicted the democratic dictum that all individuals should have the opportunity to express their views, and take part in society and politics as citizens." (2014, p.1316)

In the context of Paite narrativity this was witnessed by an adherence to liturgical themes in the publications that emerged in the latter half of the twentieth century for two reasons. Firstly, the "minority of speakers" were men who were engaged as evangelist school teachers or mission workers. Secondly, the "majority of listeners" were again men whose first encounter with the vernacular written word were scriptural translations. An in-built mechanism of censorship that filtered entries in the community's literary corpus was enforced as the church owned the only printing press. Clearly, there operates a duality in this "one-way"-*ness* (emphasis mine) with the existence of a singular form (the print medium) and thematic content in Paite narratives.

Evidently, the existing written word had failed to be an effective medium of communication for the people regarding the development of non-liturgical publications. Tualchin Neihsial's, *Bibliography of Paite Printed Books: Paite/Tedim Pau a Laibu Neihzah Suina*, a bibliographic compilation of Paite writings published in 2016, reveals that of the approximately 1300 entries only 50 works were non-scriptural in its posturing. The community has been in a state of dormancy in the output of its non-liturgical literature.

The Internet as a Free Space

I now draw upon Habermas's seminal book *Structural Transformation of the Public Sphere* wherein he delineates the idea of a public sphere as an outcome of democratic principles in which the sole authoritative monarch was replaced by a bourgeoisie thinking class

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37. Hangzo S.

Tribal Studies : A Journal of COATS

MAGIC, AGENCY AND SOCIAL DISCOURSE IN THANGHOUHLEHLIANDOU : ANALYSING A PAITE FOLKTALE

Siamlianvung Hangzo [1]

Abstract

"Magic, Agency and Social Discourse in Thanghauleh Liandou: Analysing a Paite Folktale" examines the nature of social discourse that emerges from the interface between magic and agency in the traditional Paite society. Folktales are considered to be oral relics of a community which blend history and fiction to provide an insight into its societal set up. The focus of this paper is however on the socio-cultural nuances that are encapsulated in a fictional narrative that realistically captures the synergetic community life of its people.

The strains of tendentious thinking and conventions that emerge in the narration reveal the complexities of lived realities, captured in a relatively straightforward narrative style which at times borders on the fantastical. While "magic" and its agential attribute plays a pivotal role in the tale, the presence of a wilful mother juxtaposed against a maternal old woman, the celebration of the Ton festival and its reference to class stratification and the varying roles played by the female characters, exhibit how deeply rooted the narrative is to the masked social discourses of its time. The primarily agrarian backbone of the community is also referred to in the role of nature which constantly engages with "magic" to transform the lives of the two brothers Thanghou and Liandou.

Key words : paite, magic, agency, symbolism, socio-cultural discourse

Introduction

Simon Bronner in the Meaning of Folklore ascribes to the genre of folklore an influence to "provide a release from reality" by using "symbols in elaborated narratives" which amplifies experience and although there is an element of fantasy in the narrative, folklore "does not detract from its truthfulness or significance" (2007, p.3). Simply put, though folklores provide a means of momentary fanciful escape it remains firmly entrenched in reality to a large extent.The noted folklorist, Alan Dundes, in his article "Folklore as a Mirror of Culture" delineates how folklore genres employ a tradition

38. Devi L G

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The Lore of Lai(ren): Of Archetypal Origins, Collective (Un)conscious, and the Pakhangba Tradition in Manipur

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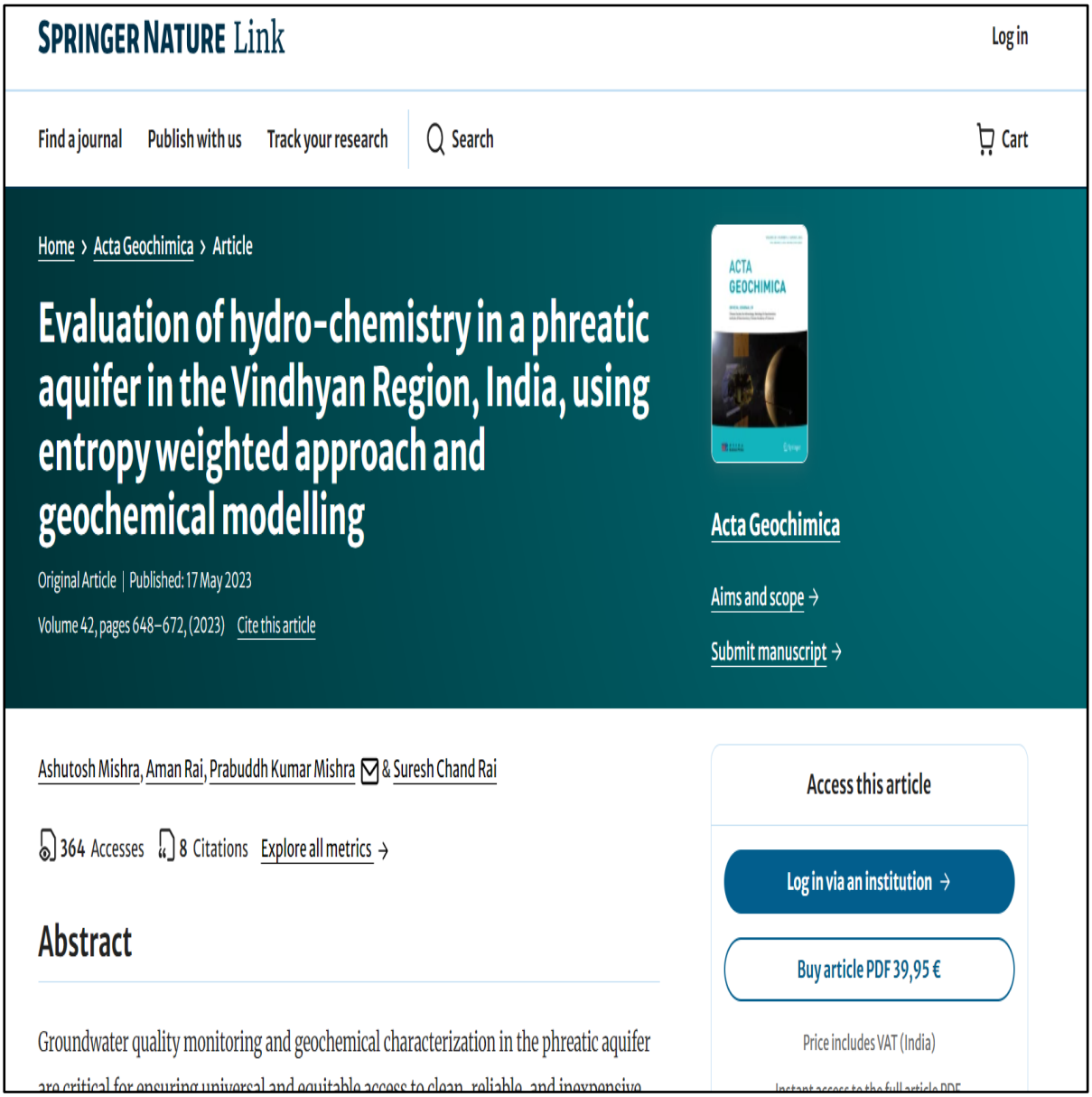
Abstract

Pakhangba is considered to be one of the foremost deities in Meitei pantheon. This deity, especially in his *lairen* (serpentine dragon) form, is integral to the cultural sensibilities and rituals of the Meiteis in Manipur. Taking the centrality of Pakhangba in Meitei politico-cultural space into perspective, this paper presents a reading of *(Lai)ren* Pakhangba lore beyond the cosmological and cultural underpinnings. Simultaneously, it examines if the lore of *lairen* – ensconced in the collective ethos of the people – and the symbolic presence of this deity in both spiritual and secular space be explained as an expression of the 'collective unconscious'. This paper establishes Pakhangba and his lore as a psychocultural connective that binds and evokes the indigeneity and identity of the people. At the same time, it foregrounds the centrality of nurturing and promoting such psychocultural connective in – beyond evoking a shared ancestry and pasts – imagining a more viable and tangible polity that veers away from a single-ethnicity based or territory-oriented politics and polity that undermine the centuries-old politico-cultural history of Manipur.

Keywords: Pakhangba; Collective (Un)conscious; Folklore; Hill-Valley; Manipur.

39. Mishra A Rai A, **Mishra PK** & Rai SC



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Evaluation of hydro-chemistry in a phreatic aquifer in the Vindhyan Region, India, using entropy weighted approach and geochemical modelling

Original Article | Published: 17 May 2023

Volume 42, pages 648–672, (2023) Cite this article

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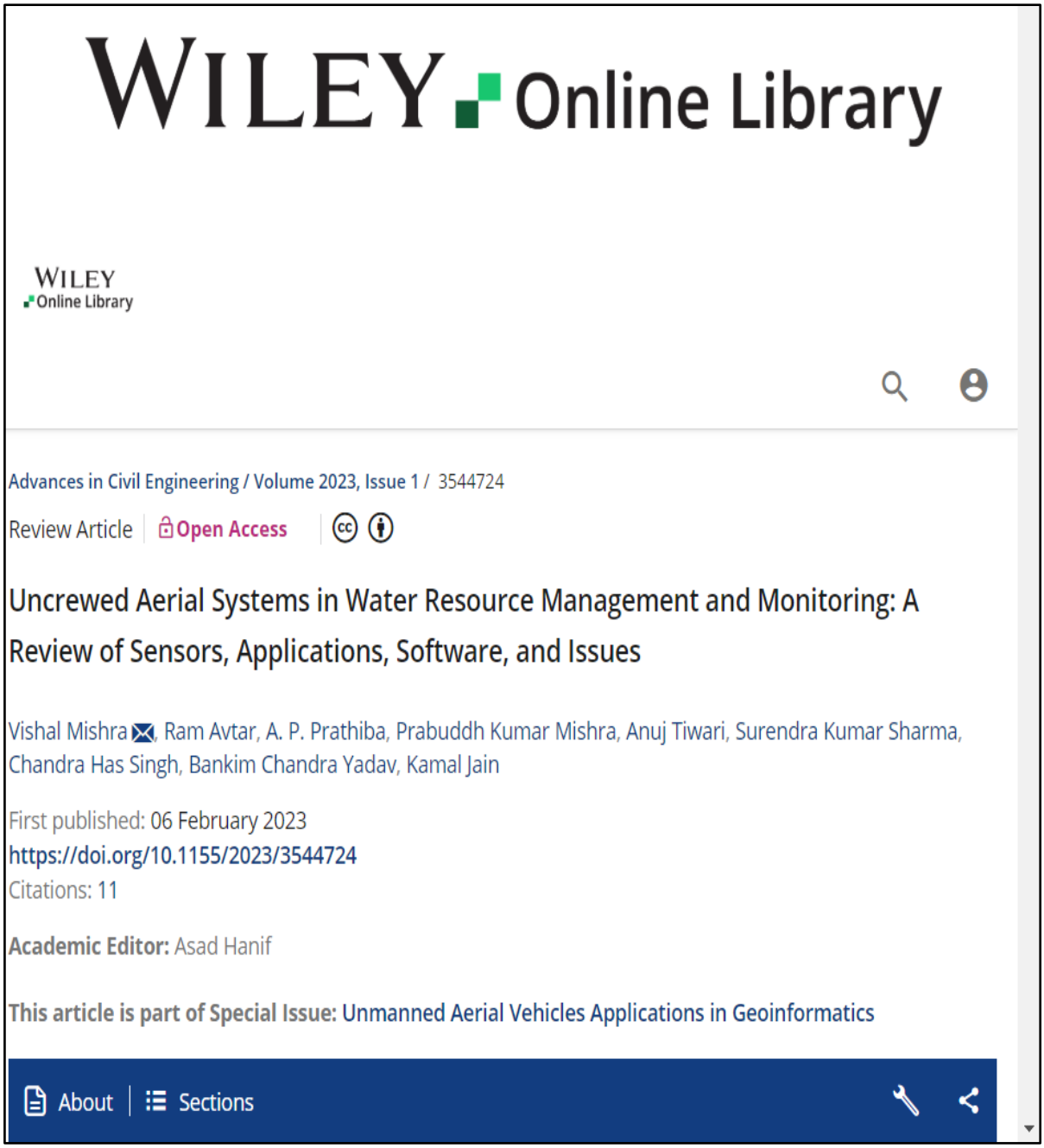
Abstract

Groundwater quality monitoring and geochemical characterization in the phreatic aquifer

40. . Mishra V, Avtar, R, Prathiba AP, **Mishra PK**, Tiwari A, Sharma SK, Singh CH, Yadav BC & Jain K.



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Advances in Civil Engineering / Volume 2023, Issue 1 / 3544724

Review Article | Open Access

Uncrewed Aerial Systems in Water Resource Management and Monitoring: A Review of Sensors, Applications, Software, and Issues

Vishal Mishra, Ram Avtar, A. P. Prathiba, Prabuddh Kumar Mishra, Anuj Tiwari, Surendra Kumar Sharma, Chandra Has Singh, Bankim Chandra Yadav, Kamal Jain

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About | Sections

41. Kumari M, Rai SC & **Mishra PK**

Annals of the National Association of Geographers, India
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Impact of Land-use/cover Changes on Groundwater Level Dynamics in Semi-Arid Region of India

Munesh Kumari[1], Suresh Chand Rai[2*] and Prabuddh Kumar Mishra[3]

Abstract

A large-scale land transformation after the green revolution (modernization of Agriculture with the consumptive use of high yielding variety (HYV) seeds, fertilizers and pesticides complemented with irrigation facilities to increase the food production of India during the 1960s) has altered the hydrological cycle and water balance in the semi-arid region of southern Haryana. In this context, this paper analyzes the impact of land-use/cover changes and intensive agricultural practices on the groundwater status in the area from 1980 to 2015. Supervised classification (maximum likelihood technique) has been used to perform change detection, whilst the Groundwater Development Index and change detection method have been used for the computation of groundwater storage change. The result indicates that the area under crops has decreased from 602611 km² to 591589 km², while an unprecedented growth of (97.80%) has been witnessed in the built-up area in all these years. The water table has fallen from 9.27mbgl (meters below ground level) in 1980 to 25.58 mbgl in 2015, at the rate of 0.4m per year as the water-efficient crops such as wheat, sugarcane, and paddy have been replaced by less water-consuming crops such as mustered, jowar, bajra, maize, and gram. Groundwater development has exceeded 100% of the natural replenishment level in the Gurgaon and Palwal districts and lies in the 'Over-exploited' category. Hence, it is needed to monitor the land use/cover changes and groundwater withdrawals and increase the body of quantitative evidence to check the pressure of the growing human population and climate change on water resources in the region.

Keywords: Land-use/cover change, Built-up area, Groundwater development index, Cropping pattern, Semi-arid region, India.

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42. Wijesinghe WMDC, Withanage NC, **Mishra PK** & Tripathi S

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Research Article

Indexing habitat suitability and human-elephant conflicts using GIS-MCDA in a human-dominated landscape

W.K.N.C. Withanage[a,b], M.D.K.L. Gunathilaka[c], Prabuddh Kumar Mishra[d,*], W.M.D.C. Wijesinghe[a], Sumita Tripathi[e]

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HIGHLIGHTS

- The study area is one of the key elephant pathways in Sri Lanka.
- Human-elephant conflict (HEC) is a result of habitat fragmentation and encroachment.
- Habitat suitability and HEC risk zones were assessed using AHP and GIS-MCDA.
- Elephant habitats are found in locations that are at high risk for HEC.
- The findings serve as a benchmark for future HEC mitigation.

GRAPHICAL ABSTRACT

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ABSTRACT

Concerns for biodiversity loss, wildlife conservation, and habitat destruction have dominated the policy agenda worldwide for decades. Unsustainable human-induced development and negative interaction between humans and wildlife have emerged as predominant issues globally. The present study deals with human and elephant conflicts (HEC) in the Polpitigama Divisional Secretariat, Sri Lanka, which is located in the Kahalla-Pallekele elephant corridor and connects Wilpattu and Kaudulla wildlife sanctuaries. The research objectives are identifying spatial patterns of elephant habitat suitability and probable risk zones for HEC. The elephant habitat suitability and HEC risk zones were identified on spatial and temporal scales using Geographic Information System integrating Multi-Criteria Decision Analysis. Different factors, including habitat suitability, distance to roads, distance to croplands, distance to forests and protected areas, settlements, and population density, were considered to determine HEC risk zones in the area. Topography, water, and vegetation criteria are considered when determining elephant habitat suitability. The results of the Analytic Hierarchy Process run the spatially explicit model. The results revealed that of the total area, 15.3% is very highly suitable for elephant habitats, while the least suitable areas contribute only 4%. About 33.8% of the area is moderately suitable for elephants. The risk map indicates that 23.7% of the total area is under very high risk for HEC, and the least risk areas only account for 5.4%. About 26.2% of the area falls under the moderate risk zone for HEC. Since the model considered three aspects of HEC, it will help policymakers in wildlife conservation to avoid and minimize the HEC.

1 Introduction

As a gregarious animal and a flagship species, the Asian elephant (*Elephas maximus*) lives in 13 different countries ranging from the Indian subcontinent in the west to Indo-China in the east, including islands such as Borneo, Sumatra, and Sri Lanka (IUCN, 2017). According

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43. Maurya SK, Singh V, **Mishra PK** & Chand K

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EFFECTS OF LAND USE AND CLIMATE CHANGE ON SOIL EROSION: A REVIEW PAPER

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ABSTRACT

Plants need soil, a dynamic mineral and organic matter combination that either supports plant development or has the potential to do so. Soil is formed gradually over long periods due to the interplay of source material, climate, biotic, slope, and time. All life on Earth depends on the soil under its feet. However, erosion of soil happens quickly. Land, freshwater, and saltwater ecosystems are all at risk from soil erosion, making it a significant contributor to soil degradation worldwide. Water erosion over land is the emphasis of this study, with wind erosion also being a factor. In order to generate more accurate worldwide projections, earth-system modelers and policymakers alike should benefit from a better understanding of the likely future rates of soil erosion increased by human activity. Agricultural techniques dictate considerable soil loss and thus degrade the soil resource in the hilly parts of India that are extensively farmed, notably in the ones dedicated to viticulture. Of India's total land area of 328 million hectares, over 175 million hectares are severely eroding due to widespread deforestation and poor land management. Not only may the onsite impacts of soil erosion be detrimental, but the offsite implications of sediment transport to the channel network and infrastructures can also be unsustainable. This systematic paper aims to review of the most used estimation models and the influenced factors for soil erosion, with the purpose to provide some guidance to those involved in these studies.

Key Words: *Erosion, Conservation, runoff, land use, global warming, climate change,*

I. INTRODUCTION

Numerous research has investigated the connection between land use and water erosion [1]. According to Sharma et al. [2], plant cover has a more significant influence than soil characteristics on soil runoff. In other words, the erosion rate in forested areas is much lower than in less vegetated areas like rainfed farming because the forest canopy effectively controls the runoff impact. Sharma et al. [2] find the same conclusion: that less forest cover in India increases erosion risk, even though forests are often regarded as an efficient barrier against soil erosion.

More than rainfall variability or slope, land use is a major factor in soil erosion intensity. "Since plants and plant cover residues tend to slow down the movement of surface runoff as well as allow the excess surface water to infiltrate into the ground, vegetation cover that is intrinsically related to land use [3] is considered to be effective in reducing the energy of erosion driving force, especially from rain drops". Furthermore, the

44. Mishra V, Malik K, Agarwal V, **Mishra PK** & Jain K

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Quaternary Science Advances

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Impact assessment of unsustainable airport development in the Himalayas using remote sensing: A case study of Pakyong Airport, Sikkim, India

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ABSTRACT

Ground deformation is a widespread phenomenon that accelerates due to anthropogenic land development. Thus reclaimed/created land is more vulnerable to deformation and subsidence, especially in mountain areas. Advanced Differential Synthetic Aperture Radar Interferometry (A-DInSAR) can be used to monitor such projects. The Pakyong Airport is an engineering feat, constructed by cutting a mountain and converting it into a tabletop in a landslide-prone zone and seismically active region of the Sikkim Himalayas. The cutting of hill slopes for airport construction and other anthropogenic activities has increased slope instability in the region. This paper studies the slow-moving landslides in the airport neighbourhood using A-DInSAR on Sentinel-1 time series data consisting of 64 images of ascending track and 82 images of the descending track. The time period of monitoring was from October 2014 to April 2018 (43 months). The images have been connected using the Minimum Spanning Tree graph for interferogram generation for estimating deformation. The atmospheric noise was removed, and the results enabled the identification of deformation (in line-of-sight) on the airstrip as well as in the neighbouring area, both the upslope and downslope of the airport. The deformation rates estimated were up to ±90 mm/year in Pakyong from both tracks. We could successfully capture such land movement associated with the Pakyong Airport construction and help assess the impacts of infrastructure construction on the slope stability of the area. The controlling factors such as precipitation, seismicity, geology and others were analysed with respect to the deformation obtained. This study helps in assessing the land deformation after construction (cutting and filling of the slope) in the area. The deformation detected in this study needs to be addressed for the safety of the residents as well as for the infrastructure present in the area.

1. Introduction

The Earth's natural resources, such as land, fresh water, and forests, are limited. The continuously rising human population leads to over-utilisation and mismanagement of natural resources. This has alarmed the administrators, scientists and policymakers to emphasize on sustainable development. The human settlement leads to construction in mountainous areas, thus disturbing their delicate ecosystem. These areas need special monitoring as denudating the forest cover and cutting off the slope for developing infrastructure harms the ecological balance. The construction activities such as dams & reservoirs (Kumar and Anbalagan, 2019; Sati et al., 2020; Mishra and Jain, 2022), roads (Sangra et al., 2017), highways (Siddque and Pradhan, 2018), airports (Wang et al., 2018) and townships (Ram and Gupta, 2021) results in many hazards which are detrimental to human lives and destroy natural resources in the region. Sustainable development goals envisioned by United Nations (UN) have emphasised addressing these disasters and are mentioned in goals 1, 2, 9, 11 and 13 (United Nations, 2021; Zimmermann and Keiler, 2015).

The unsustainable infrastructure development in the Himalayas has made it vulnerable (Gupta et al., 2020) as mountain development and mountain hazards are intertwined. In Pakyong, Sikkim, India, a

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45. Mishra AK, Upadhyay A, **Mishra PK**, Srivastava A & Rai SC

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Evaluating geo-hydrological environs through morphometric aspects using geospatial techniques: A case study of Kashang Khad watershed in the Middle Himalayas, India

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ARTICLE INFO

Keywords:
Morphometric analysis
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Kashang Khad Watershed
Geographic information system
Remote sensing

ABSTRACT

The present study analyzes the geo-hydrological behaviour of the Kashang khad basin of the sathuj river system in Kinnaur district, Himachal Pradesh. The major source of water in the region is the snowmelt, which contributes to the evolution of a drainage pattern. It highlights the importance of ASTER GDEM and satellite images for assessing and understanding the various geo-hydrological parameters such as drainage analysis, and topographic analysis for better basin management. Hydrological modelling of ArcGIS 10.5 has been used for the delineation and analysis of basins using SRTM DEM with 30 m resolution. Morphometric parameters like linear, relief, and aerial further help in the micro-level study of its physiographic characteristics and structural control of flow along with runoff, which can help predict floods, their extent, and intensity. It was found that the basin had a dendritic pattern with uniform lithology. The stream order ranges from 1st order to 5th order signalling homogeneity in texture and medium to high drainage density meaning permeable soil and good surface runoff. The drainage texture of 2.19 indicates the basin is prone to weathering and erosion. The bifurcation ratio ranges from 4.43 to 5.23, with a mean Rb of 4.82 showing the structural control on the elongated basin with Re of 0.56. The ASTER DEM and sophisticated morphometric attributes and hydrological environs can be effectively utilized in watershed management and other hydrological studies in higher mountainous regions.

1. Introduction

Morphometric analysis refers to quantitatively examining the different nature, forms, and characteristics of the earth's surface and any landform like a river basin (Strahler, 1952). Morphometry involves variables that take numeric values, which can be retrieved based on topography and from topographic maps. Morphometry uses an ideal areal unit for interpreting and examining the fluvially originated landforms that unveiled an open system of operation. Relief and climate are vital factors that influence the functioning of running water ecosystems at the basin scale (Lotspeich and Platts, 1982; Frissell et al., 1986). It examines the geometric and topological characteristics of landforms (Evans, 2012). Morphometric descriptors epitomize a relatively single strategy for demonstrating the basin processes and comparing basin characteristics (Mesa, 2006), and permitting an enriched understanding of the geological and geomorphic history of the drainage basin (Strahler, 1964). The role of rock types and geologic structure can be implicitly understood by using morphometric techniques (Zavoianu, 1985). The morphometric study of rivers enlightens the adequate association of the form of drainage basins with the characteristics of their river networks, the density, and length of river networks, and basin surface area (Zavoianu, 1985). Morphometry provides reasonable evidence through the topographical, geological, and hydrological behaviour of the basin (Angillieri, 2012). Morphometric descriptors depict comparatively easy methods for demonstrating basin processes and comparing basin characteristics (Mesa, 2006). Morphometric characteristics influence basin

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46. Wijesinghe D, **Mishra PK**, Withanage NC, Abdelrahman K, Mishra V, Tripathi S, Fnais MS.

Application of GIS, Multi-Criteria Decision-Making Techniques for Mapping Groundwater Potential Zones: A Case Study of Thalawa Division, Sri Lanka

by Dilnu Chanuwan Wijesinghe [1,2], Prabuddh Kumar Mishra [3,*], Neel Chaminda Withanage [1,2], Kamal Abdelrahman [4], Vishal Mishra [5], Sumita Tripathi [6] and Mohammed S. Fnais [4]

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Abstract

Groundwater resources are depleting due to phenomena such as significant climate change and overexploitation. Therefore, it is essential to estimate water production and identify potential groundwater zones. An integrated conceptual framework comprising GIS and the analytical hierarchy process (AHP) has been applied for the present

47. Kumar S, Singh PK, Anshu & **Tiwari P**

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UNPACKING LITERACY BACKWARDNESS AND GENDER DISPARITIES IN ARUNACHAL PRADESH: A COMPREHENSIVE ANALYSIS OF TAWANG DISTRICT

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Pratyush Kumar Singh Ph.D. Research Scholar, Centre for the Study of Regional Development, School of Social Sciences, Jawaharlal Nehru University, Delhi.
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ABSTRACT
This study explores the issue of literacy backwardness and gender disparities in Arunachal Pradesh, India, using data from the 1991-2011 Census, demographic statistics, and economic indicators. It analyses the literacy and education situation in Tawang District and Arunachal Pradesh state over the past three decades, focusing on various dimensions such as educational institutions, student enrollment, student-teacher ratio, and expenditure. Arunachal Pradesh, the largest state in the Northeastern region of India, has seen an upward trajectory in literacy rates, but significant gender gaps persist, particularly in rural areas. The Tawang district population faces interconnected economic and educational challenges, emphasising the need for targeted interventions to uplift education and alleviate poverty. The study emphasises the urgency of addressing gender disparities and infrastructure development to foster holistic educational development in Arunachal Pradesh. The findings can serve as a foundation for policymakers, educators, and stakeholders to formulate strategic measures that prioritise gender-equitable, quality education, and economic progress for the state and its inhabitants.
Keywords: Literacy, Backwardness, Monpas, School

Introduction

Education is a crucial factor in shaping a society's future, promoting economic progress, social upliftment, moral enlightenment, and wisdom cultivation. As educational standards increase, lifestyles, and potential accomplishments also increase. The 21st century is marked by unprecedented advancements in scientific exploration and technology, but still, some areas still lack access to education, often due to discrimination, deprivation of basic rights, or historical factors. Dismantling systemic barriers, addressing historical injustices, and championing equitable access to education is crucial for societies to navigate the complexities of the modern world and achieve holistic progress, inclusive development, and an enlightened future. India's constitutional framework emphasises the obligation of state governments to ensure universal and cost-free primary education for its citizens. The Third Five-Year Plan highlights the importance of education in fostering economic advancement, technological innovation, and a societal structure rooted in freedom, social equity, and equal opportunity. Education programs form the foundational building blocks for uniting citizens, channelling their potential, and harnessing innate and human resources. The National Policy on Education of 1986 and its Program of Action review in 1992 aimed to enhance education across all strata, prioritizing unfettered primary education for children aged 6 to 14, eradicating illiteracy, integrating vocational education, including children with special needs, and focusing on education for women, marginalized communities, and minorities. The Sustainable Development Goal 4 (SDG4), which India accepted in 2015, is a reflection of the global education development agenda. It aims to provide inclusive and equitable quality education and advance opportunities for lifelong learning for everyone by 2030. The Centre's 2021-22 Performance Grading Index identifies three bottom states - Arunachal Pradesh, Meghalaya, and Mizoram - as needing more effort to reach the top slot in school education status.

The constitutional framework prioritizes the development of tribal regions in Arunachal Pradesh. Post-independence, various developmental strategies have been implemented to ensure

48. Upadhyay A, Nigam NK, **Mishra PK** & Rai SC

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RESEARCH

Climatic variability and its impact on the indigenous agricultural system using panel data analysis in the Sikkim Himalaya, India

Aakash Upadhyay · Narander Kumar Nigam · Prabuddh Kumar Mishra · Suresh Chand Rai

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Abstract Climate-induced extreme events with fluctuations in climatic indicators like temperature and precipitation highly influence crop productivity. This study deals with quantitative analysis of climatic variability and crop production (1990–2018) using panel data regression analysis. The focus is on variability of three crops, i.e., paddy, maize, and wheat in the Rangit river basin of Sikkim Himalaya, India. Meterological data were acquired from the Indian Meteorological Department, agricultural data from the state agricultural department and a field survey were also conducted with the farmers, using a structured questionnaire, focused group discussion, and key informant observations. The acquired data was analyzed with the help of correlation and multiple linear regression analysis to analyze the relationship between climatic variability and crop production. The result of the study shows that all three crops are dependent on rainfall; however, paddy was the most sensitive to climatic variability. It was found that the overall grain production had an inverse relation to temperature, but it had a positive correlation with rainfall. It was observed that there was a continuous decline in the overall production of paddy and wheat. During deficiency years, it was found that when −11.33% rainfall was deficient, paddy yield declined by −1.52%. Further, a deviation of −13.48% led to a decline of −54.78% in wheat. The study advocates that timely policy interventions and strategies shall reduce climatic shocks and improve productivity. This would strengthen the livelihood security of the local communities, overcome the challenges of food security, and ensure long-term sustainability of Rangit River basin.

Keywords Temperature · Rainfall · Variability · Crop production · Panel data · Sustainable development goals-13

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Introduction

Climate change is natural and has changed since time immemorial, with recent changes mainly attributed

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49. Maurya S K, Singh V, Chand K & **Mishra PK**

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Perceptions and practices of indigenous soil conservation measures in beas valley, Himachal Pradesh, India

Suraj Kumar Maurya · Vartika Singh · Kesar Chand · Prabuddh Kumar Mishra

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Abstract This study delves into the perceptions and practices of indigenous soil conservation measures in the erosion-prone Upper Beas Valley of Kullu, Himachal Pradesh, India. The region's susceptibility to severe soil erosion poses significant challenges for sustainable agriculture. Employing a mixed-method approach, including Likert scale-based surveys, field observations, focus group discussions, and key informant interviews, the research gathers insights from 106 participants. The questionnaire had eight questions and employed a Likert scale, which is a regularly used rating scale in behavioural research. Primary data were gathered in the form of surveys using a random sampling technique throughout the summer months of June 2023. The villages of Phozal, Manali, Katrain, and others like them were the primary focus of the study since they are situated along the riverfront in the upper Beas Valley. The study underscores the paramount role of traditional knowledge and practices in mitigating soil erosion. Techniques such as pre-monsoon plowing, filter strips, earthing-up, mulching, and soil compression have demonstrated their efficacy in restoring soil fertility and enhancing land productivity. The findings underscore the potential for refining perceptions and practices surrounding soil erosion and conservation, thereby indicating avenues for improved soil management and sustainable agriculture. This study highlights the importance of amalgamating indigenous wisdom with scientific insights to develop holistic strategies for erosion control, soil management, and heightened agricultural yield. By recognizing and integrating local knowledge, context-specific solutions can be devised for similar regions grappling with soil erosion challenges. Scientific data, gathered from multiple sources like CRU rainfall data, FAO soil maps, and satellite imagery, revealed the spatial distribution of erosion risk, enhancing our understanding of soil erosion dynamics in the Beas Valley. This study highlights the importance of amalgamating indigenous wisdom with scientific insights to develop holistic strategies for erosion control, soil management, and heightened agricultural yield. By recognizing and integrating local knowledge, context-specific solutions can be devised for similar regions grappling with soil erosion challenges.

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Research article

An ecotourism suitability index for a world heritage city using GIS-multi criteria decision analysis techniques

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ABSTRACT

The concept of ecotourism has experienced a significant surge in popularity over the past two decades, primarily driven by the multitude of adverse impacts associated with mass tourism. The objective of the study was to develop a comprehensive ecotourism suitability index to guide policymakers in implementing tourism development policies. Given the considerable appeal of the study area to both local and international tourists, it is essential to conduct a systematic evaluation to pinpoint suitable areas for ecotourism development. This necessity arises from the study area's placement within a fragile ecosystem and its proximity to a UNESCO World Heritage site. We employed a Geographic Information Systems (GIS) integrated environment coupled with a fuzzy Multi-Criteria Decision Analysis (MCDA) methodology. The GIS-MCDA integrated framework leverages the Analytic Hierarchy Process (AHP) and a weighted linear combination that seeks to amalgamate many features and criteria to assess ecotourism potential by integrating 20 criteria into six separate categories: landscape, topography, accessibility, climate, forest and wildlife, and negative factors. Weights were allocated to each criterion and factor based on the expert's opinions of their impact on the development of ecotourism. The final ecotourism suitability index comprised five unique classes: very high, high, moderate, less, and not suitable. Results reveal that out of the total areas, 45.4 % (259 km^2) are within the high and very high suitable classes. The sensitivity analysis suggested that ecotourism potentials are more favorable to forest and accessibility variables. The generated index can be utilized as a road map since validation verified a 64 % accuracy. Given the dearth of earlier research, this study provides vital support for the development of sustainable ecotourism projects in the study area.

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51. Maurya SK, Singh V, Chand K & **Mishra PK**

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Assessment of soil erosion in the Beas Valley, Kullu, Himachal Pradesh: A study of Western Himalayan landscape, Northern India

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Abstract

Soil erosion is a formidable global challenge with far-reaching consequences. It results in the depletion of soil nutrients, land degradation, decreased agricultural output, heightened runoff, and the exacerbation of geological hazards such as landslides and debris flows. This study focuses on the assessment of soil erosion in the Beas Valley region of Kullu, Himachal Pradesh, situated in the Western Himalaya landscape of Northern India. The research employs various datasets and a well-defined methodology to analyze the complex interactions between climate, soil, topography, and land use in order to understand and mitigate soil erosion risks. The primary data sources utilized in this study include rainfall data from the Climate Research Unit at the University of East Anglia, soil data from the Food and Agriculture Organization, Digital Elevation Model (DEM) data from the Shuttle Radar Topography Mission, and satellite imagery from Landsat. The research methodology is based on the Revised Universal Soil Loss Equation (RUSLE), a widely accepted model for assessing soil erosion. The RUSLE equation (A= R·K·LS·C·P) incorporates several factors to quantify soil erosion rates. The R-factor, derived from monthly and annual rainfall data, is used to estimate erosivity. The K-factor, determined using soil type and composition, characterizes soil erodibility. The LS-factor considers slope and flow accumulation, while the C-factor is calculated based on the Normalized Difference Vegetation Index (NDVI) from satellite imagery. Lastly, the P-factor accounts for the effectiveness of conservation practices. This interdisciplinary approach provides valuable insights into the dynamics of soil erosion in the Beas Valley region. By leveraging cutting-edge data sources, filed visit and a robust methodology, this study contributes to a better understanding of soil erosion processes in a fragile Himalaya ecosystem, facilitating informed land management decisions and environmental conservation efforts.

52. Preeti

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'Fractured' Peasantry in Colonial Bihar in the Late Nineteenth and Early Twentieth Centuries: Reflections and Responses

Preeti View all authors and affiliations

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Abstract

This article is an attempt at scrutinising the rural and agrarian structure through a caste framework in the late nineteenth and early twentieth centuries Bihar, a period when Bihar was undergoing economic, environmental, social and political changes owing to colonial intervention. This article will highlight these everyday negotiations, forgotten struggles and exclusions that were carried on against the background of the importation of western science and technology, changing laws and encroachment on common lands. An intrinsic mechanism was used during the changing times to keep the hierarchical structure alive. Nevertheless, it led to springing up of various *kisan sabhas*, which aimed at voicing the opinions of the marginalised peasantry. New set of sources will capture different shades of peasant identities and a vast multitude of peasant politics that range from reformist to radical. When the

53. Rani N, Garg S, Bamel K, Bhatt V, Sharma S, Mishra SK, Saini N & Saloni

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REVIEW ARTICLE

A systematic review and comparative meta-analysis of non-destructive fruit maturity detection techniques

Neetu Rani[1], Savita Garg[2]*, Kiran Bamel[3], Vaibhav Bhatt[1], Sourabh Sharma[4], Shashvat Kumar Mishra[1], Nitesh Saini[5] & Saloni[3]

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Abstract

The global fruit industry is growing rapidly due to increased awareness of the health benefits associated with fruit consumption. Fruit maturity detection plays a crucial role in fruit logistics and maintenance, enabling farmers and fruit industries to grade fruits and develop sustainable policies for enhanced profitability and service quality. Non-destructive fruit maturity detection methods have gained significant attention, especially with advancements in machine vision and spectroscopic techniques. This systematic review provides a concise overview of the techniques and algorithms used in fruit quality grading by farmers and industries. The study reviewed 63 full-text articles published between 2012 and 2023 along with their bibliometric analysis. Qualitative analysis revealed that researchers from various disciplines contributed to this field, with techniques falling into 3 categories: machine vision (mathematical modelling or deep learning), spectroscopy and other miscellaneous approaches. There was a high level of diversity among these categories, as indicated by an I-square value of 88.37% in the heterogeneity analysis. Meta-analysis, using odds ratios as the effect measure, established the relationship between techniques and their accuracy. Machine vision showed a positive correlation with accuracy across different categories. Additionally, Egger's and Begg's tests were used to assess publication bias and no strong evidence of its occurrence was found. This study offers valuable insights into the advantages and limitations of various fruit maturity detection techniques. For employing statistical and meta-analytical methods, key factors such as accuracy and sample size have been considered. These findings will aid in the development of effective strategies for fruit quality assessment.

Keywords

Image processing; machine vision; spectroscopy; maturity detection; fruit maturity; mathematical modelling

Introduction

In the era of globalisation, consumer's preference for fresh and high-quality produce has experienced a significant surge. Their demand for flavourful produce with abundant nutritional value has increased exponentially (1-3). To meet these expectations, the ability to harvest fruit at the precise moment of peak maturity plays a crucial role. However, determining this

54. Rani N, Bamel K, Saini N, Gupta S, Nath RA, Sharma S & Mishra I

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REVIEW ARTICLE **OPEN ACCESS**

Non-destructive Fruit Volume Estimation using Digital Image Processing Techniques: A Systematic Review

Neetu Rani[1], *Kiran Bamel[2], Nitesh Saini[3], Sneha Gupta[1], Raghav Anand Nath[1], Sourabh Sharma[4] and Ishita Mishra[1]

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ABSTRACT

The global fruit industry has experienced steady growth over the past decade driven by increased health benefits awareness and demand for organic produce. Thus, non-destructive fruit volume estimation is vital to provide a high-quality product at a fair price, maximise packaging usage, and minimise the transportation costs and spoilage risk due to overfilling. The field of digital image processing has wide-ranging applications in key technical disciplines, including remote sensing, medical imaging, encoding, etc. In addition to that, it is prevalent in grading systems for packing lines as it can precisely determine a fruit's volume and mass without compromising its quality. The present systematic review provides a thorough analysis of the existing literature on digital image processing techniques and the various algorithms used to evaluate their accuracy and applicability in estimating fruit volume by examining factors like uniformity, size, and shape of the fruit. We reviewed 56 full-text articles published between 2013 and 2023 for information on techniques for fruit volume estimation. As per our analysis, the techniques employed by researchers from multiple disciplines are from three major domains - model based, stereo based and deep learning. Upon scrutinizing their intricacies, we found that the most accurate techniques we came across incorporated the use of 2D projective images, kinect sensors and MVS (multi-view stereo) algorithm & mask R-CNN respectively for the three specified domains. Our study has the potential to assist stakeholders in recognising the advantages and drawbacks of current techniques, while also offering valuable comprehension on room for improvement to achieve efficient real time applications.

Keywords: *Volume Estimation, Modelling, Stereo vision, Deep Learning*

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INTRODUCTION

The global fruit industry has seen a steady rise in popularity as demand for fresh produce among the consumers grows [1-4]. Advancements in computer technology and AI have enabled the use of computer vision in agriculture [5,6]. The precise measurement of fruit volume plays a critical role in managing and coordinating various aspects of the fruit industry, such as sorting, yield estimation, quality inspection, predicting optimum harvest times, and optimising transportation and packaging costs [7-10]. Timely monitoring of fruit size and shape also helps in improving the quality and productivity of a farm [11,12]. Traditionally, volume of fruits is measured manually using water and gas displacement methods [13,14]. However, these methods are time-consuming, demanding a lot of human labour, and require specialist hardware [15-18]. With advancements in digital imaging techniques, non-destructive methods have emerged as a promising alternative for fruit volume estimation [19]. Significant efforts in application of computer vision technology for fruit volume estimation have led to many new advancements. Existing methods can be broadly classified under 3 approaches: Model based approach, Stereo based approach and

55. Jyoti, Vashisht LK & **Sinha UK**

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Matrix-Valued Gabor Frames over LCA Groups for Operators

Jyoti, Lalit Kumar Vashisht, Uttam Kumar Sinha

View PDF

G\v avruta studied atomic systems in terms of frames for range of operators (that is, for subspaces), namely K-frames, where the lower frame condition is controlled by the Hilbert-adjoint of a bounded linear operator K. For a locally compact abelian group G and a positive integer n, we study frames of matrix-valued Gabor systems in the matrix-valued Lebesgue space $L^2(G, \mathbb{C}^{n\times n})$, where a bounded linear operator Θ on $L^2(G, \mathbb{C}^{n\times n})$ controls not only lower but also the upper frame condition. We term such frames matrix-valued (Θ, Θ^*)-Gabor frames. Firstly, we discuss frame preserving mapping in terms of hyponormal operators. Secondly, we give necessary and sufficient conditions for the existence of matrix-valued (Θ, Θ^*)- Gabor frames in terms of hyponormal operators. It is shown that if Θ is adjointable hyponormal operator, then $L^2(G, \mathbb{C}^{n\times n})$ admits a λ-tight (Θ, Θ^*)-Gabor frame for every positive real number λ. A characterization of matrix-valued (Θ, Θ^*)-Gabor frames is given. Finally, we show that matrix-valued (Θ, Θ^*)-Gabor frames are stable under small perturbation of window functions. Several examples are given to support our study.

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On matrix-valued Gabor frames over locally compact abelian groups

Uttam Kumar Sinha, Lalit Kumar Vashisht, and Pankaj Kumar Das

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Abstract

In this paper, we study Gabor frames in the matrix-valued signal space $L^2(G, \mathbb{C}^{n\times n})$, where G is a locally compact abelian group which is metrizable and σ-compact, and n is a positive integer. First, we give sufficient conditions on scalars in an infinite combination of vectors (from a given matrix-

57. Jain A

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Prime Ideal Theorem for Fuzzy Lattices

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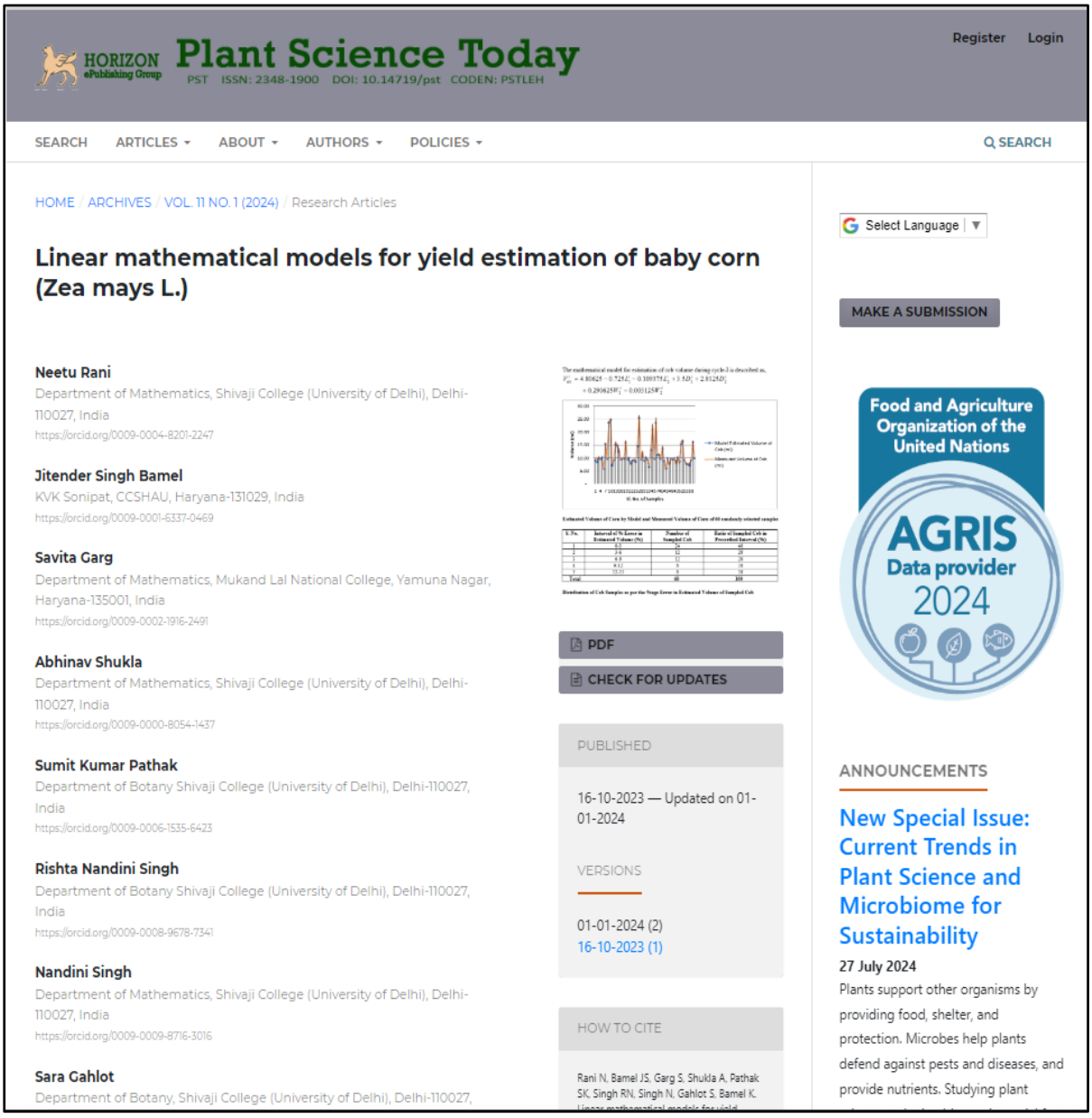
58. Rani N, Bamel JS, Garg S, Shukla A, Pathak SK, Singh RN, Singh N, Gahlot S & **Bamel K.**



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Linear mathematical models for yield estimation of baby corn (Zea mays L.)

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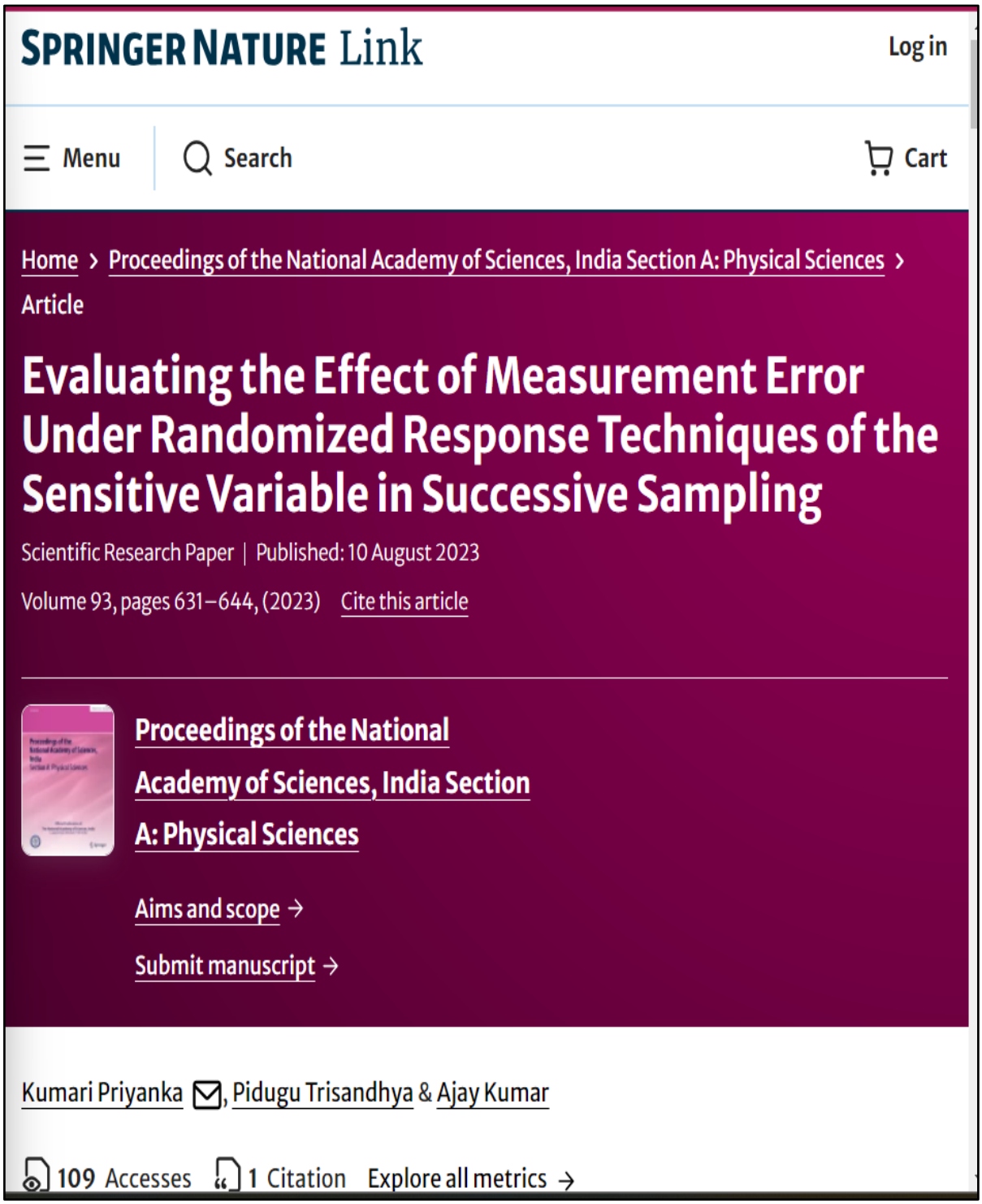
59. Priyanka K, Trisandhya P & Kumar A



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Abstract

61. Khandelwal V, Sirohi P, Satapathy S, Pradhan S, **Kumar S** et.al

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Journal of Alloys and Compounds
Volume 983, 5 May 2024, 173785

A comprehensive analysis of the structural, microstructural, optical, and piezocatalytic activity of $Ba_{0.92}Ca_{0.08}Zr_{0.09}Ti_{0.91}O_3$ and $Ba_{0.98}Ca_{0.02}Zr_{0.07}Ti_{0.93}O_3$ lead-free ceramics

Vartika Khandelwal [a], Piyush Siroha [a], S. Satapathy [b], Sonali Pradhan [b], Surendra Kumar [c], Narender Kumar [d], Jitendra Gangwar [e], S.K. Majumder [b], Ramovatar [a] ✉, Neeraj Panwar [f] ✉

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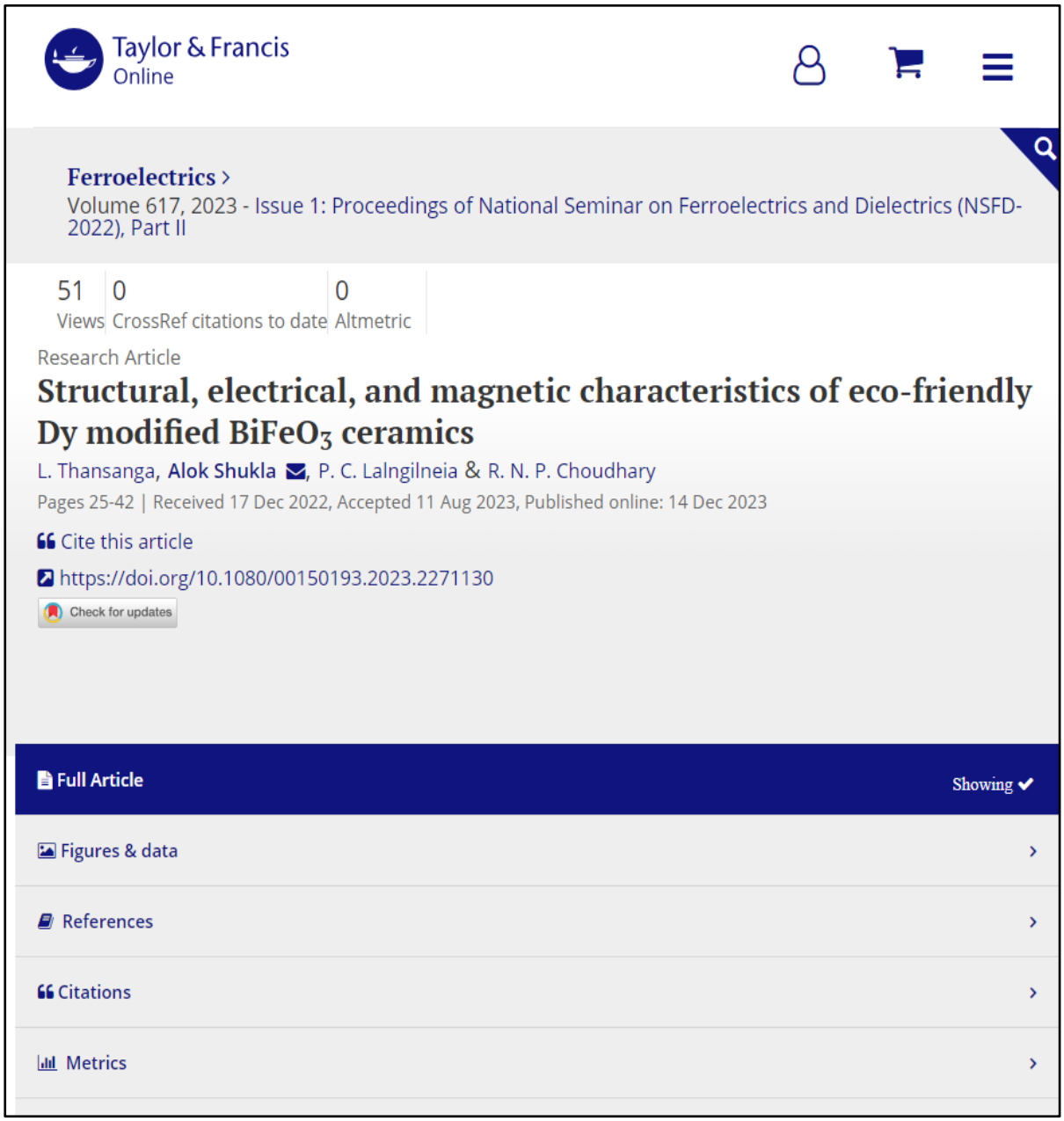
Highlights

62. Rajput J, Pramanik AK, Kumar P, **Gaur SS**, Singh R & Kant N

63. Thansanga L, Shukla A, Lalngilneia PC & Choudhary RNP



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Ferroelectrics ›
Volume 617, 2023 - Issue 1: Proceedings of National Seminar on Ferroelectrics and Dielectrics (NSFD-2022), Part II

51 Views | 0 CrossRef citations to date | 0 Altmetric

Research Article

Structural, electrical, and magnetic characteristics of eco-friendly Dy modified $BiFeO_3$ ceramics

L. Thansanga, Alok Shukla, P. C. Lalngilneia & R. N. P. Choudhary

Pages 25-42 | Received 17 Dec 2022, Accepted 11 Aug 2023, Published online: 14 Dec 2023

Cite this article

https://doi.org/10.1080/00150193.2023.2271130

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64. Dhawan P, Saini A, Grover K, Goel S, **Tyagi N**, Kumar P & Yadav H.

Materials Research Bulletin 169 (2024) 112516

Contents lists available at ScienceDirect

Materials Research Bulletin

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Research Papers

A methodical investigation on the growth and characterization of a third-order nonlinear optical novel co-crystal of 8-hydroxyquinolinium phthalate: X-ray, Hirshfeld surface, optical, mechanical, thermal and DFT analysis

Preetika Dhawan [a], Anupama Saini [b], Karan Grover [a], Sahil Goel [c], Nidhi Tyagi [d], Pradeep Kumar [c], Ranjana Jha [a], Harsh Yadav [a,*]

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[b] Department of Chemistry, Hindu College, University of Delhi, New Delhi 110007, India
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B. crystal growth
B. luminescence
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D. crystal structure

ABSTRACT

A novel non-linear optical single crystal of 8-hydroxyquinolinium phthalate has been as-synthesised by a slow evaporation solution growth technique. Single-crystal X-ray diffraction analysis affirms that it belongs to a monoclinic crystal system. While UV–visible spectroscopy shows its optical transparency with a direct band gap of 2.80 eV, a photoluminescence study confirms a principal yellow emission at 370 nm excitation. Furthermore, the mechanical and thermal properties along with the functional groups' study have also been laid out in this paper. Intermolecular interactions present in the crystal are ascertained from Hirshfeld surface and fingerprint plot studies. The Z-scan technique has reportedly affirmed third harmonics generation in the same. Theoretical calculations using DFT modelling further testify to the experimental observations thereby laying out the framework of the mentioned crystal in terms of its optimized geometry, molecular electrostatic potential, frontier molecular orbital, natural bond orbital and natural population analysis along with vibrational assignments and UV absorption analysis.

1. Introduction

Researchers' fraternity in the modern era has been tremendously exploiting the synthesis and usage of nonlinear optical (NLO) materials for a wide variety of industrial applications such as optical signal processing and computing, laser amplifiers, devices like ultra-short pulsed lasers and sensors, fibre-optics communication, optoelectronics, optical ultrafast switching, optical data storage, optical phase conjugation [1–4]. Our study emphasizes the avenue of production of co-crystals for the development of NLO materials. A co-crystal is a crystalline entity formed by two or more different molecular moieties in a particular stoichiometric ratio via weak intermolecular interactions like hydrogen bonding, Van der Waals interactions, π- π stacking etc. The crystal so obtained can exist in various forms like polymorphs, solvates, hydrates etc. thereby modifying and improving various structural, physical, and chemical properties like hygroscopicity, solubility and compaction behavior [5,6]. As they are generally formed by charge-transfer (CT) interactions between the donor and acceptor moiety via photophysical and photochemical processes, they more profoundly show third harmonic generation (THG) and fluorescence properties for organic complexes owing to their aggregation behaviors at the supramolecular scale like molecular conformations, stacking fashions and intermolecular interactions [7–12]. Furthermore, they exhibit photoelectric properties via a synergistic coupling effect while still retaining the original single crystal's characteristics [0].

It has been reported that organic materials exhibit greater NLO behavior than inorganic ones [1] as they possess their structural features such as the π-electron conjugation system substituted by CT functional groups by both ends of the molecule which gives the push-pull design of the molecule, thereby enhancing the optical nonlinearity and

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Available online 3 September 2023

65. Tyagi N, Sinha N, Yadav H, Kumar P &.Kumar B

Applied Physics A (2024) 130:231
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Applied Physics A
Materials Science & Processing

Crystal structure, Hirshfeld topology analysis, enrichment ratio, energy framework and DFT computational studies of piezoelectric L-histidinium tetrafluoroborate single crystal

Nidhi Tyagi[1,3] · Nidhi Sinha[1,2] · Harsh Yadav[1,4] · Pradeep Kumar[5] · Binay Kumar[1]

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Abstract

The nonlinear L-histidinium tetrafluoroborate (LHFB) single crystals have been grown by the slow evaporation method. The single-crystal XRD confirms the monoclinic lattice system with the $P2_1$ space group and explains molecular electron charge density distribution for grown crystals. The diffraction data are refined to a final Refinement factor (R) value of 0.04. The growth rate of LHFB crystal is determined by a morphological study. The 3D Hirshfeld surface gives information about the intermolecular interaction present and the 2D fingerprint plot shows the nature of intermolecular close contact experienced by the molecules in a crystal. Energy frameworks have been computed by the Hirshfeld topology. The value of the enrichment ratio has been deduced to help understand the crystal packing interaction. 3D energy framework is a new way for understanding the topology of all types of interaction of the molecule in the crystal. The lower value of the dielectric loss at higher frequencies has increased the optical quality of the crystal. The piezoelectric property was reported for the first time in LHFB single crystal. The piezoelectric charge coefficient (d_{33}) is found to be 4 pC/N. The promising piezoelectric and dielectric studies of grown crystal make it suitable for various optoelectronics, energy harvesting, piezoelectric transducers and patch antennae for wireless communication applications. Mechanical properties reveal that the LHFB crystals belong to the softer nature. The voids present in the grown crystal were estimated at different isosurface values, which give information about the mechanical strength and porosity of the compound. The computing of geometric parameters, optimization energies, frontier molecular orbital energies and molecular surface electrostatic potential were performed using the Gaussian 09 program package in the DFT/B3LYP/6-311++G(d,p) basis set.

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Published online: 15 March 2024

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66. Khuswaha DS

एक नेतृत्वकर्ता के रूप में अटल बिहारी वाजपेयी, राजनेता, सांसद एवं प्रधानमंत्री

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DOI: https://doi.org/10.32381/LP.2023.15.04.1

श्रीप्रकाश सिंह* और धारासिंह कुशवाहा**

सारांश

स्वाधीनता पश्चात काल में, भारतीय लोकतंत्र की दशा एवं दिशा के निर्धारण में राजनीतिक नेतृत्व की भूमिका बेहद महत्वपूर्ण रही है। एक राजनीतिक नेतृत्वकर्ता के रूप में अटल बिहारी वाजपेयी ने भी राजनेता, सांसद, विदेश मंत्री तथा प्रधानमंत्री जैसे महत्वपूर्ण पदों पर रहते हुए भारत की लोकतांत्रिक शासन व्यवस्था के कार्यचालन के सन्दर्भ में अपना विशेष योगदान दिया है। वास्तव में, एक राजनीतिक नेतृत्वकर्ता के रूप में अटल बिहारी वाजपेयी का योगदान बहुआयामी रहा है।

स्वाधीन भारत के राजनीतिक मानचित्र पर, अटल बिहारी वाजपेयी ने एक राजनेता की भूमिका में करीब पाँच दशक से अधिक का समय बिताया। अक्सर उन्हें आपसी सहयोग एवं सामंजस्य पर आधारित राजनीतिक नेतृत्व शैली संबंधी विशेषताओं के लिए याद किया जाता रहा है। अपनी विलक्षण वाक्पटुता एंव तर्कसंगत टीका–टिप्पणी की योग्यता के चलते, अटल बिहारी वाजपेयी ने भारतीय संसदीय संस्थाओं के सुसंगत संचालन में वृहद, विशेष एवं उल्लेखनीय योगदान दिया है। व्यावहारिक राजनीति में भी, पहले भारतीय जनसंघ तथा बाद में भारतीय जनता पार्टी का नेतृत्व करते हुए उन्होंने अपनी पार्टी की राजनीतिक स्थिति को सुदृढ़ करने में महत्वपूर्ण भूमिका निभाई। अपनी राजनीतिक यात्रा के चरम पर, अटल बिहारी वाजपेयी ने भारतीय लोकतंत्र के 'शीर्ष राजनीतिक नेतृत्वकर्ता' की भूमिका भी निभाई और तीन बार प्रधानमंत्री पद का कार्यभार संभाला।

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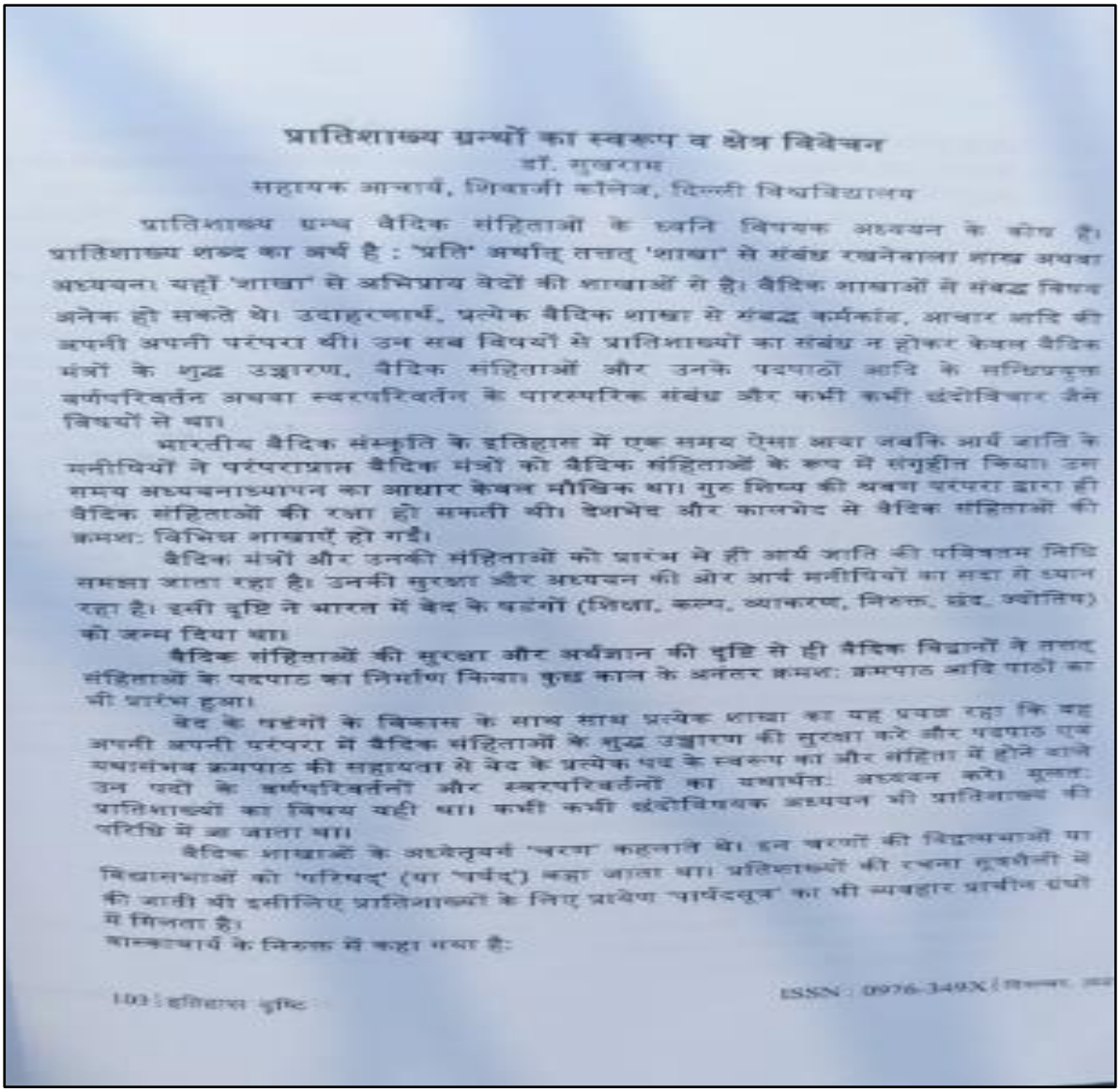


प्रातिशाख्य ग्रन्थों का स्वरूप व क्षेत्र विवेचन

डॉ. सुखराम
सहायक आचार्य, शिवाजी कॉलेज, दिल्ली विश्वविद्यालय

प्रातिशाख्य ग्रन्थ वैदिक संहिताओं के ध्वनि विषयक अध्ययन के कोश हैं। प्रातिशाख्य शब्द का अर्थ है : 'प्रति' अर्थात् तत्तत् 'शाखा' से संबंध रखनेवाला शास्त्र अथवा अध्ययन। यहाँ 'शाखा' से अभिप्राय वेदों की शाखाओं से है। वैदिक शाखाओं से संबद्ध विषय अनेक हो सकते थे। उदाहरणार्थ, प्रत्येक वैदिक शाखा से संबद्ध कर्मकांड, आचार आदि की अपनी अपनी परंपरा थी। उन सब विषयों से प्रातिशाख्यों का संबंध न होकर केवल वैदिक मंत्रों के शुद्ध उच्चारण, वैदिक संहिताओं और उनके पदपाठों आदि के सन्धिप्रयुक्त वर्णपरिवर्तन अथवा स्वरपरिवर्तन के पारस्परिक संबंध और कभी कभी छंदोविचार जैसे विषयों से था।

भारतीय वैदिक संस्कृति के इतिहास में एक समय ऐसा आया जबकि आर्य जाति के मनीषियों ने परंपराप्राप्त वैदिक मंत्रों को वैदिक संहिताओं के रूप में संगृहीत किया। उस समय अध्ययनाध्यापन का आधार केवल मौखिक था। गुरु शिष्य की श्रवण परंपरा द्वारा ही वैदिक संहिताओं की रक्षा हो सकती थी। देशभेद और कालभेद से वैदिक संहिताओं की क्रमशः विभिन्न शाखाएँ हो गईं।

वैदिक मंत्रों और उनकी संहिताओं को प्रारंभ से ही आर्य जाति की पवित्रतम निधि समझा जाता रहा है। उनकी सुरक्षा और अध्ययन की ओर आर्य मनीषियों का सदा से ध्यान रहा है। इसी दृष्टि ने भारत में वेद के षडंगों (शिक्षा, कल्प, व्याकरण, निरुक्त, छंद, ज्योतिष) को जन्म दिया था।

वैदिक संहिताओं की सुरक्षा और अर्थज्ञान की दृष्टि से ही वैदिक विद्वानों ने तत्तत् संहिताओं के पदपाठ का निर्माण किया। कुछ काल के अनंतर क्रमशः क्रमपाठ आदि पाठों का भी प्रारंभ हुआ।

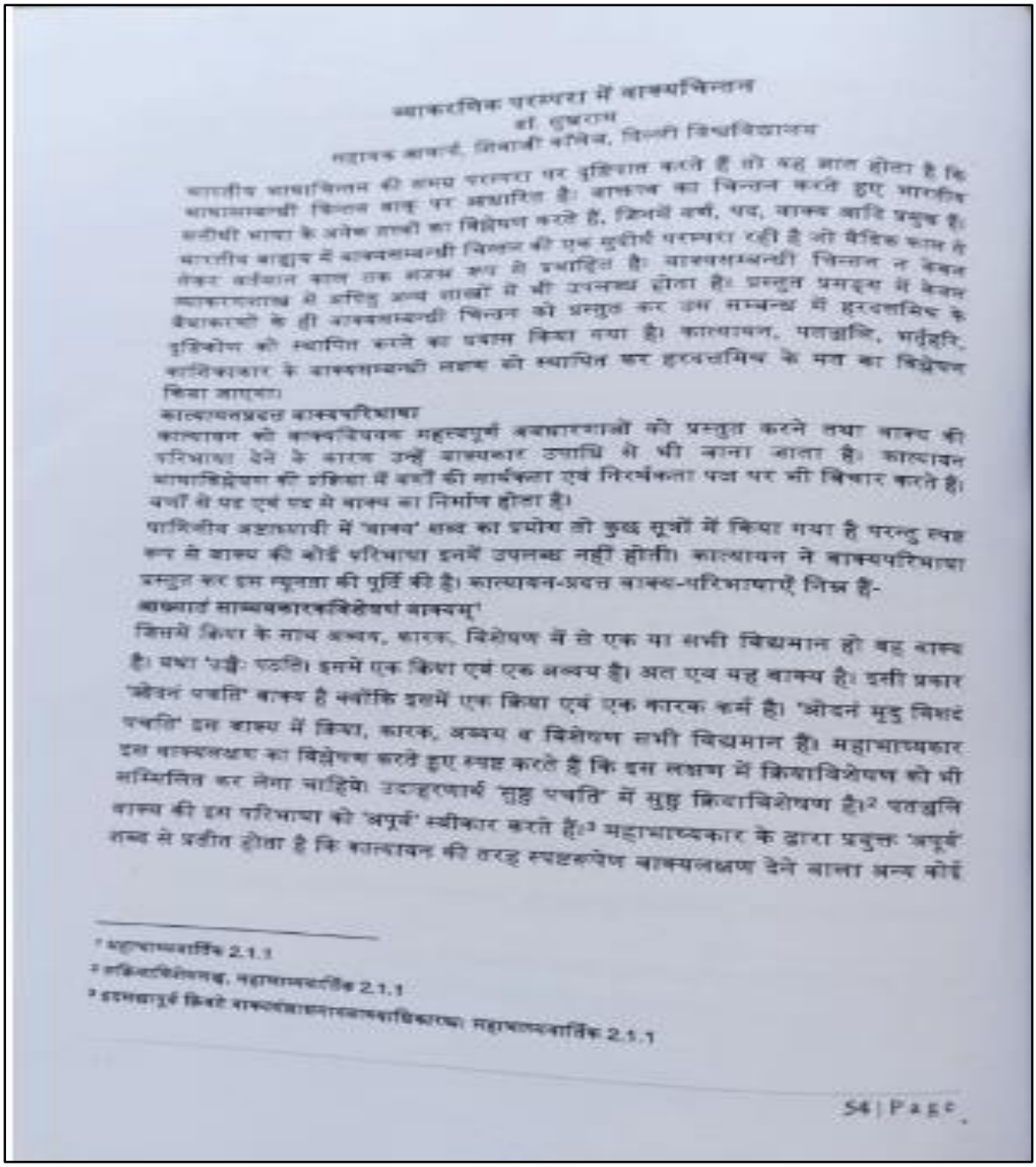
वेद के षडंगों के विकास के साथ साथ प्रत्येक शाखा का यह प्रयत्न रहा कि वह अपनी अपनी परंपरा में वैदिक संहिताओं के शुद्ध उच्चारण की सुरक्षा करे और पदपाठ एवं यथासंभव क्रमपाठ की सहायता से वेद के प्रत्येक पद के स्वरूप का और संहिता में होने वाले उन पदों के वर्णपरिवर्तनों और स्वरपरिवर्तनों का यथार्थतः अध्ययन करे। मूलतः प्रातिशाख्यों का विषय यही था। कभी कभी छंदोविषयक अध्ययन भी प्रातिशाख्य की परिधि में आ जाता था।

वैदिक शाखाओं के अध्येतृवर्ग 'चरण' कहलाते थे। इन चरणों की विद्वत्सभाओं या विद्वानसभाओं को 'परिषद्' (या 'पर्षद्') कहा जाता था। प्रातिशाख्यों की रचना सूत्रशैली में की जाती थी इसीलिए प्रातिशाख्यों के लिए प्रायेण 'पार्षदसूत्र' का भी व्यवहार प्राचीन ग्रंथों में मिलता है।

याज्ञवल्क्य के निरुक्त में कहा गया है:

ISSN : 0976-349X

68. Dr. Sukhram



व्याकरणिक परम्परा में वाक्यचिन्तन

डॉ. सुखराम

सहायक आचार्य, शिवाजी कॉलेज, दिल्ली विश्वविद्यालय

भारतीय भाषाचिन्तन की समग्र परम्परा पर दृष्टिपात करते हैं तो यह ज्ञात होता है कि भाषासम्बन्धी चिन्तन वाक् पर आधारित है। वाक्तत्व का चिन्तन करते हुए भारतीय मनीषी भाषा के अनेक तत्वों का विश्लेषण करते हैं, जिसमें वर्ण, पद, वाक्य आदि प्रमुख हैं। भारतीय वाङ्मय में वाक्यसम्बन्धी चिन्तन की एक सुदीर्घ परम्परा रही है जो वैदिक काल से लेकर वर्तमान काल तक अक्षुण्ण रूप से प्रवाहित है। वाक्यसम्बन्धी चिन्तन न केवल व्याकरणशास्त्र में अपितु अन्य शास्त्रों में भी उपलब्ध होता है। प्रस्तुत प्रसङ्ग में केवल वैयाकरणों के ही वाक्यसम्बन्धी चिन्तन को प्रस्तुत कर इस सम्बन्ध में हरदत्तमिश्र के दृष्टिकोण को स्थापित करने का प्रयास किया गया है। कात्यायन, पतञ्जलि, भर्तृहरि, कैयटिकाकार के वाक्यसम्बन्धी लक्षण को स्थापित कर हरदत्तमिश्र के मत का विश्लेषण किया जाएगा।

कात्यायनप्रदत्त वाक्यपरिभाषा

कात्यायन को वाक्यविषयक महत्त्वपूर्ण अवधारणाओं को प्रस्तुत करने तथा वाक्य की परिभाषा देने के कारण उन्हें वाक्यकार उपाधि से भी जाना जाता है। कात्यायन भाषाविश्लेषण की प्रक्रिया में वर्णों की सार्थकता एवं निरर्थकता पक्ष पर भी विचार करते हैं। वर्णों से पद एवं पद से वाक्य का निर्माण होता है।

पाणिनीय अष्टाध्यायी में 'वाक्य' शब्द का प्रयोग तो कुछ सूत्रों में किया गया है परन्तु स्पष्ट रूप से वाक्य की कोई परिभाषा इनमें उपलब्ध नहीं होती। कात्यायन ने वाक्यपरिभाषा प्रस्तुत कर इस न्यूनता की पूर्ति की है। कात्यायन-प्रदत्त वाक्य-परिभाषाएँ निम्न हैं-

आख्यातं साध्यवकारकविशेषणं वाक्यम्[1]

जिसमें क्रिया के साथ अव्यय, कारक, विशेषण में से एक या सभी विद्यमान हों वह वाक्य है। यथा 'पचति' एतति। इसमें एक क्रिया एवं एक अव्यय है। अत एव यह वाक्य है। इसी प्रकार 'ओदनं पचति' वाक्य है क्योंकि इसमें एक क्रिया एवं एक कारक कर्म है। 'ओदनं मृदु निघट पचति' इस वाक्य में क्रिया, कारक, अव्यय व विशेषण सभी विद्यमान हैं। महाभाष्यकार इस वाक्यलक्षण का विश्लेषण करते हुए स्पष्ट करते हैं कि इस लक्षण में क्रियाविशेषण को भी सम्मिलित कर लेना चाहिये। उदाहरणार्थ 'सुष्ठु पचति' में सुष्ठु क्रियाविशेषण है।[2] पतञ्जलि वाक्य की इस परिभाषा को 'अपूर्व' स्वीकार करते हैं।[3] महाभाष्यकार के द्वारा प्रयुक्त 'अपूर्व' शब्द से प्रतीत होता है कि कात्यायन की तरह स्पष्टरूपेण वाक्यलक्षण देने वाला अन्य कोई

[1] महाभाष्यवार्तिक 2.1.1

[2] क्रियाविशेषणम्, महाभाष्यवार्तिक 2.1.1

[3] इदमपूर्वं क्रियते वाक्यलक्षणानामवाक्यधिकारात्। महाभाष्यवार्तिक 2.1.1

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Indian J Ophthalmol. 2023 Mar;71(3):977-982. doi: 10.4103/ijo.IJO_1494_22.

Establishment of patient-derived xenografts of retinoblastoma and choroidal melanoma on the avian chorioallantoic membrane

Nimita Kant [1], Perumal Jayaraj [2], Seema Sen [3], Harshita Rupani [2], Pranavi Kumar [2], Shefali Dahiya [2], Palak Chugh [2], Muskaan Gupta [2], Manisha Sengar [4]

Affiliations + expand

PMID: 36872721 PMCID: PMC10229989 DOI: 10.4103/ijo.IJO_1494_22

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› Microb Genom. 2023 Apr;9(4):mgen000987. doi: 10.1099/mgen.0.000987.

Monkeypox virus: phylogenomics, host-pathogen interactome and mutational cascade

Roshan Kumar [1], Shekhar Nagar [2], Shazia Haider [3], Utkarsh Sood [4], Kalaiarasan Ponnusamy [5], Gauri Garg Dhingra [4], Shailly Anand [6], Ankita Dua [7], Mona Singh [2], Roushan Kumar [1], Manisha Sengar [2], Indrakant Kumar Singh [2 8], Rup Lal [9 10]

Affiliations + expand

PMID: 37043267 PMCID: PMC10210936 DOI: 10.1099/mgen.0.000987

Abstract

While the world is still recovering from the Covid-19 pandemic, monkeypox virus (MPXV) awaits to cause another global outbreak as a challenge to all of mankind. However, the Covid-19 pandemic has taught us a lesson to speed up the pace of viral genomic research for the implementation of preventive and treatment strategies. One of the important aspects of MPXV that needs immediate insight is its evolutionary lineage based on genomic studies. Utilizing high-quality isolates from the GISAID (Global Initiative on Sharing All Influenza Data) database, primarily sourced from Europe and North America, we employed a SNP-based whole-genome phylogeny method and identified four major clusters among 628 MPXV isolates. Our findings indicate a distinct evolutionary lineage for the first MPXV isolate, and a complex epidemiology and evolution of MPXV strains across various countries. Further analysis of the host-pathogen interaction network revealed key viral proteins, such as E3, SPI-2, K7 and CrmB, that play a significant role in regulating the network and inhibiting the host's cellular innate immune system. Our structural analysis of proteins E3 and CrmB revealed potential disruption of stability due to certain mutations. While this study identified a large number of mutations within the new outbreak clade, it also reflected that we need to move fast with the genomic analysis of newly detected strains from around the world to develop better prevention and treatment methods.

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› Planta. 2023 Jul 5;258(2):37. doi: 10.1007/s00425-023-04182-4.

Differential expression of genes during recovery of Nicotiana tabacum from tomato leaf curl Gujarat virus infection

T Namgial [1 2], A K Singh [# 2], N P Singh [# 3], A Francis [# 3], D Chattopadhyay [# 3], A Voloudakis [4], S Chakraborty [5]

Affiliations + expand

PMID: 37405593 PMCID: PMC10322791 DOI: 10.1007/s00425-023-04182-4

Erratum in

Correction to: Differential expression of genes during recovery of Nicotiana tabacum from tomato leaf curl Gujarat virus infection.

Namgial T, Singh AK, Singh NP, Francis A, Chattopadhyay D, Voloudakis A, Chakraborty S.

Planta. 2023 Jul 25;258(3):51. doi: 10.1007/s00425-023-04206-z.

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Amycolatopsis mediterranei: A Sixty-Year Journey from Strain Isolation to Unlocking Its Potential of Rifamycin Analogue Production by Combinatorial Biosynthesis

Utkarsh Sood, Moritz Müller, Tian Lan, Gauri Garg, Nirjara Singhvi, Princy Hira, Priya Singh, Aeshna Nigam, Mansi Verma, Pushp Lata, Hardeep Kaur, Abhilash Kumar, Charu Dogra Rawat, Sukanya Lal, Courtney Aldrich*, Andreas Bechthold*, and Rup Lal*

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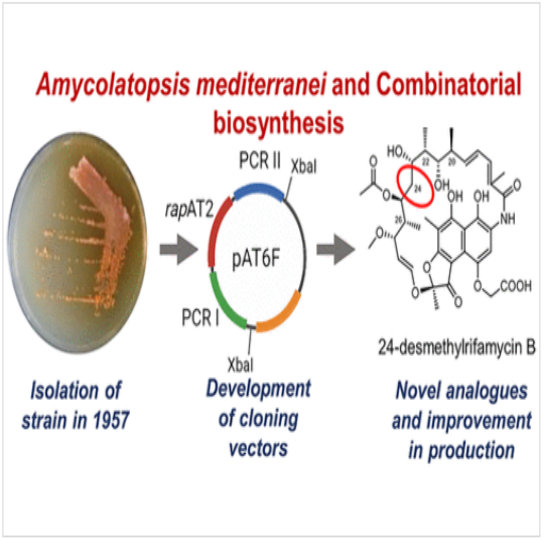
Abstract

Ever since the isolation of *Amycolatopsis mediterranei* in 1957, this strain has been the focus of research worldwide. In the last 60 years or more, our understanding of the taxonomy, development of cloning vectors and conjugation system, physiology, genetics, genomics, and biosynthetic pathway of rifamycin B production in *A. mediterranei* has substantially increased. In particular, the development of cloning vectors, transformation system, characterization of the rifamycin biosynthetic gene cluster, and the regulation of rifamycin B production by the pioneering work of Heinz Floss have made the rifamycin polyketide biosynthetic gene cluster (PKS) an attractive target for extensive genetic manipulations to produce rifamycin B analogues which could be effective against multi-drug-resistant tuberculosis. Additionally, a better understanding of the regulation of rifamycin B production and the application of newer genomics tools, including CRISPR-assisted genome editing systems, might prove useful to overcome the limitations associated with low production of rifamycin analogues.



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Molecular Nutrition & Food Research / Volume 68, Issue 6 / 2300688

Review

From Gut to Hormones: Unraveling the Role of Gut Microbiota in (Phyto)Estrogen Modulation in Health and Disease

Nikki Kumari, Rashmi Kumari, Ankita Dua, Mona Singh, Roushan Kumar, Poonam Singh, Susan Duyar-Ayerdi, Sunila Pradeep, Akinyemi I. Ojesina, Roshan Kumar

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Citations: 1

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Abstract

The human gut microbiota regulates estrogen metabolism through the "estrobolome," the collection of bacterial genes that encode enzymes like ß-glucuronidases and ß-glucosidases.