

3.4.3 Research Papers Published During the Year 2022-23

Sr. No.	Title of paper	Name of the author/s	Department of the teacher	Name of journal	ISSN number	Is it listed in UGC Care list	Page No.
1.	<u>Arbuscular mycorrhizal species composition during rainy season from polluted sites and their role biofertilizer</u>	Ashwini Deshpande	Botany	<u>International Journal of Food and Nutritional Science</u>	2320-7876	<u>YES</u>	1-3
2.	<u>Arbuscular mycorrhizal species composition during rainy season from polluted sites and their role biofertilizer</u>	Mahavir Gosavi	Botany	<u>International Journal of Food and Nutritional Science</u>	2320-7876	<u>YES</u>	1-3
3.	<u>Evaluation of antibacterial, antioxidant and seed germination potential of Biosynthesized silver nanoparticles from bark extracts of Ailanthus excelsa Roxb.</u>	Neeraja Tutakne	Botany	<u>The Journal of Plant Science Research</u>	0970-2539	<u>YES</u>	4-7
4.	<u>Arbuscular mycorrhizae spores diversity in summer from polluted sites</u>	Mahavir Gosavi	Botany	<u>Journal of the asiatic society of mumbai</u>	0972-0766	<u>YES</u>	8-10
5.	<u>Arbuscular mycorrhizae spores diversity in summer from polluted sites</u>	Ashwini Deshpande	Botany	<u>Journal of the asiatic society of mumbai</u>	0972-0766	<u>YES</u>	8-10
6.	<u>In-Vitro Studies and Multiple Shootlet Induction in Cyathocline purpurea (Buch.-Ham. ex D.Don) Kuntze</u>	Mahavir Gosavi	Botany	<u>The Journal of Plant Science Research</u>	0976-3880	<u>YES</u>	11-13
7.	<u>In-Vitro Studies and Multiple Shootlet Induction in Cyathocline purpurea (Buch.-Ham. ex D.Don) Kuntze</u>	Ruchika Dani	Botany	<u>The Journal of Plant Science Research</u>	0976-3880	<u>YES</u>	11-13
8.	<u>Synthesis of alkyl levulinate as fuel blending agent by catalytic valorization of carbohydrates via alcoholysis: Recent advances and challenges</u>	Kirtikumar C. Badgujar	Chemistry	<u>Catalysis Today</u>	1873-4308	<u>YES</u>	14-16

9.	<u>Highly efficient magnetically separable Zn-Ag@l-arginine Fe3O4 catalyst for synthesis of 2-aryl-substituted benzimidazoles and multicomponent synthesis of pyrimidines</u>	Nitin A. Mirgane	Chemistry	<u>Results in chemistry</u>	2211-7156	<u>YES</u>	17-19
10.	<u>Recent update on use of ionic liquids for enzyme immobilization, activation, and catalysis: A partnership for sustainability</u>	Kirtikumar C. Badgujar	Chemistry	<u>Current Opinion in Green and Sustainable Chemistry</u>	2452-2236	<u>YES</u>	20-22
11.	<u>Study of (n,p), (n, alpha) and (n,2n) reactions of stable and radio-nuclides produced in a reactor environment</u>	Vishal Desai	Physics	<u>Pramama journal of physics</u>	0973-7111	<u>YES</u>	23-25
12.	<u>Recent Development of Aluminates in Solid State Lighting</u>	Aarti Muley	Physics	<u>Progress in Solid State Chemistry</u>	0079-6786	<u>YES</u>	26-28
13.	<u>Jalsandharan Va Vyavasthapan: Mahilancha Sahbgh</u>	Rashmi Bhure	Politics	<u>Parivartanacha Watsaru</u>	2250-3145	<u>YES</u>	29-32
14.	<u>Role of influencer marketing in branding</u>	Vaneta Raney	Mass media	<u>Shodhaprabha</u>	0974-8946	<u>YES</u>	33-35
15.	<u>Determination of Antioxidant and Anti quorum Sensing Activity of Aegle marmelos Picrorrhiza kurroa and Swertia chirayita</u>	Pramod Kamble	Microbiology	<u>Defence Science Journal</u>	2456-0537	<u>YES</u>	36-38
16.	<u>Determination of Antioxidant and Anti quorum Sensing Activity of Aegle marmelos Picrorrhiza kurroa and Swertia chirayita</u>	Manju Phadke	Microbiology	<u>Defence Science Journal</u>	2456-0537	<u>YES</u>	36-38
17.	<u>Pragatisheel Parampara Ka Prathinidhi Kavi :Trilochan</u>	Dinesh Pathak	Hindi	<u>Ajanta</u>	2277-5730	NO	39-41
18.	<u>Sanskritik sankraman ke swikar ki chunautiyaan Aur Hindi Pravasi katha sahitya</u>	Dinesh Pathak	Hindi	<u>Royal</u>	2278-8158	NO	42-44
19.	<u>Is Pakistan Still an Irritant in India-US Relations? in FINS Journal of Diplomacy and Strategy</u>	Rashmi Bhure	Politics	<u>FINS Journal of Diplomacy and Strategy</u>	2581-6586	NO	45-46
20.	<u>Enhancing Bilateral Connectivity:Recent Developments an Upswing in India-Bangladesh Ties</u>	Rashmi Bhure	Politics	<u>FINS Journal of Diplomacy and Strategy</u>	2581-6586	NO	47-48
21.	<u>Boosting Road Connectivity in Arunachal Pradesh and Eastern Sector of LAC</u>	Rashmi Bhure	Politics	<u>FINS Journal of Diplomacy and Strategy</u>	2581-6586	NO	49-50

NAAC SSR -Cycle 4 : 2018-2023

Metric No.:3.4.3 Number of research papers published in the Journals as notified on UGC CARE list

2022-23

This is to certify that pages from number 1 to 50 of the attached documents/reports are verified and found to be true.



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Arbuscular Mycorrhizal Species Composition During Rainy Season From Polluted Sites And Their Role As Biofertilizer

Mrs. Ashwini Deshpande¹, Dr. Mahavir Gosavi²

¹Assistant Professor, Department of Botany, SIES College of Arts, Science and Commerce (Autonomous), Sion(W), Mumbai. [University of Mumbai]

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Abstract:

Arbuscular mycorrhizae (AM) exhibit the most positive obligate symbiotic relationship, with roots of majority of plants. They show higher ecological amplitude under adverse environmental conditions. The current study deals with the study of diversity of AM fungi during rainy season with respect to rhizosphere soil analysis for AM species composition and their subsequent role as bio-fertilizer. Spores of *Glomus*, *Sclerocystis* and *Scutellospora* were observed. The observed species were also detected in root colonization analysis, using standard staining methods. The spore density was highest for *Glomus*. It proved to be a dominant species. The application of bio-fertilizer product prepared with these dominant species was proved to be a potent bio-fertilizer in the field trials with chili crop.

Keywords: -ArbuscularMycorrhiza (AM), *Glomus*, *Sclerocystis*, *Scutellospora*

Introduction:

The mutually beneficial relationship between the feeder roots of plants and fungi is called mycorrhiza (Frank, 1885) 'Mycos' meaning fungus and 'rhiza' meaning root (Trappe, 2005). Arbuscular Mycorrhizal (AM) fungi show obligatory symbiosis and form natural partnership with Bryophytes, Pteridophytes, Gymnosperms and Angiosperms. They are even found in nutrient deficient soils. AM fungi play an essential role in plant growth, plant protection (from drought, temperature, and salinity) and soil quality. Around 80% of plants are colonized by AM fungi which belong to Glomeromycota and members of family Endogonaceae. AM fungi are employed both in agriculture and forestry (Rodrigues and Muthukumar, 2009).

The present paper deals with investigation of species composition of Arbuscular Mycorrhizae in industrially polluted MIDC area of Dombivli in Thane district of Maharashtra, with respect to their association with seasonal weeds surrounding fifteen industries of MIDC area, located at Sagarli in Dombivli (East) during rainy season. Thus, in present context, study of AM fungi for myco-remediation is an emerging significant alternative technology in the clean-up of metal contaminated soil to maintain status of environment and to use it as biofertilizer inoculums in more efficient way to serve in better way for fulfilling the growing nutritional needs of humankind.

Statement of the problem: The current study deals with identifying AM fungi species prevalent during rainy season that can be used as bio-fertilizers.

Scope of research: The seasonal AM fungi species found during rainy season can be effectively used as bio-fertilizer, with increased concentration of macronutrients.

Need of research subject: AM spores that are isolated during rainy season can be multiplied through trap culture and can be successfully used as bio fertilizer, throughout the year.

Hypothesis of problem: The pure inoculum of AM species, observed during rainy season can be used to clean up heavy metal pollution from the soils around industries, thus mycoremediation through AM fungi can be used as effective and ecofriendly technology.

Research methodology: The selected study sites were fifteen industries from MIDC, Sagarli of Dombivli (East). Different seasonal weed samples were collected growing near selected industries, along with rhizosphere soil and the spores were isolated, identified and recorded. The original percentage of carbon, nitrogen, phosphorus and potassium was estimated in the soil collected from paddy field and the field trials were taken with chili (*Capsicum annum*, L.) crop in the same paddy field by using VAM bio fertilizer product with composition of same species, raised through trap culture technique.

Research techniques: For collection of roots and rhizosphere soil samples, a steel pipe was inclined and driven into soil up to 25cm of root zone at different depths. AM fungal spores were isolated from rhizosphere soil samples, by wet sieving and decanting method (Gerdemann and Nicolson, 1963). The isolated spores were observed by lifting them with pinhead and mounting on the slide containing lactophenol as mounting medium. The isolated spores were observed under stereomicroscope, identified, and categorized. Ink and vinegar staining (Vierheilig *et.al.*, 1998) and Trypan blue staining (Philips and Hayman, 1970) of roots were carried out for root colonization of AM fungal species. Thus, AM fungal species, inhabitants of soil polluted sites were surveyed during winter season (November 2021-February, 2022). The percent root colonization with soils of rhizosphere zone from all the weed samples was calculated. The percentage frequency with individual industry was also calculated. Root colonization was



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International Journal of Food and Nutritional Sciences (IJFANS)

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1	International Journal of Food and Nutritional Sciences	Global E smart Technologies	2319-1775	2320-7876	from January-2021 to January-2023	Discontinued from Jan 2023

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Evaluation of Antibacterial, Antioxidant and Seed Germination Potential of Biosynthesized Silver Nanoparticles from Bark Extract of *Ailanthus excelsa* Roxb.

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Nanotechnology, an emerging scientific domain promises potential applications in varied sectors. Currently, research in nanotechnology focuses on the optimization of nanoparticle synthesis. Green synthesis of nanoparticles is an economic and non-toxic alternative to conventional methods. In the present study, aqueous bark extract of *Ailanthus excelsa* Roxb. was used for the biosynthesis of silver nanoparticles (AgNPs). UV-Visible Spectroscopy confirmed the presence of AgNPs with an absorption Surface Plasmon Peak at 450nm. Biosynthesized AgNPs and bark extract were investigated using Fourier Transform Infrared Spectroscopy (FTIR) for determining the functional groups in phytochemicals that act as reducing and capping agents in the synthesis process. High-Resolution Transmission Electron Microscopy (HRTEM) analysis denotes that AgNPs were predominantly spherical, with an average size of 18.84 ± 2.28 nm. The bark extract was evaluated qualitatively by preliminary phytochemical screening. Antioxidant potential of biosynthesized AgNPs and bark extract were analyzed using the DPPH method in which biosynthesized AgNPs showed significant free radical scavenging potential. Antibacterial properties of biosynthesized AgNPs were analysed against *Escherichia coli* and *Staphylococcus aureus*. Biosynthesized AgNPs and bark extract were also checked for Germination Percentage, Germination Speed Index and Seedling Vigor Index on Wheat (*Triticum aestivum* L.) and Moong (*Vigna radiata* (L.) R. Wilczek) seeds. The present study infers that *Ailanthus excelsa* Roxb. act as a potential source of green synthesis of AgNPs and may help to build a resilient system for its commercial applications in various fields.

Keywords: *Ailanthus excelsa* Roxb., Aqueous bark extract (Aq. BE), Biosynthesized, Silver nanoparticles (AgNPs), Characterization, Seed germination potential.

INTRODUCTION

In recent times, increased demand for nanoparticles have been observed for large scale commercial applications. As compared to conventional method for nanoparticle synthesis, green nanosynthesis is a cost-effective and sustainable alternative approach (Para and Baek, 2014). In the present study, bark of *Ailanthus excelsa* Roxb. is used to synthesise nanoparticles through green nanotechnology. *Ailanthus excelsa* Roxb. commonly known as 'Tree of Heaven' is a woody deciduous tree belonging to family Simaroubaceae. Independent researchers have reported presence of phytoconstituents such as alkaloids, glycosides, saponins, tannins from different parts of *A. excelsa* Roxb (Patil and Wanjare, 2007). Quassinoids, predominantly found in family Simaroubaceae have been proved as a bioreducing

agent for silver ions helping in AgNPs synthesis. Furthermore, antibacterial and antitumour activities have been reported from AgNPs synthesized from the leaves of *A. excelsa* Roxb. (Jacob and Vinamathi, 2015). The presence of bioactive molecules on the surface of AgNPs is responsible for strong antioxidant and antibacterial properties of biosynthesized nanoparticles (Srivastava et al., 2020). Reports suggest that exposure of nanoparticle increases mineral uptake by the seed and enhance germination thereby providing modern solutions to a range of problems faced in the agriculture sector (Priyanka et al., 2019). Against this background, the biosynthesis of AgNPs was carried out using the Aq. BE of *Ailanthus excelsa* Roxb. Preliminary qualitative phytochemical evaluation of bark extract was performed which is imperative for the green synthesis of AgNPs. Characterization of the

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**ARBUSCULAR MYCORRHIZAE SPORES DIVERSITY IN SUMMER
FROM POLLUTED SITES****Ashwini Deshpande**Assistant Professor, Department of Botany, SIES College of Arts, Science and Commerce
(Autonomous), Sion(W), Mumbai. [University of Mumbai]**Dr. Mahavir Gosavi**Associate Professor and Head, Department of Botany, SIES College of Arts, Science and Commerce
(Autonomous), Sion(W), Mumbai., University of Mumbai**ABSTRACT**

Arbuscular mycorrhizae (AM) exhibit the most positive obligate symbiotic relationship, with roots of majority of plants. They show higher ecological amplitude under adverse environmental conditions. The current study deals with the exclusive survey of fifteen industrial sites from MIDC, Dombivli (East). The sites were investigated to study diversity of AM fungi with respect to rhizosphere soil analysis for subsequent spore density and identification. Spores of *Acaulospora*, *Gigaspora*, *Glomus* and *Scutellospora* were observed. The observed species were also detected in root colonization analysis, using standard staining methods. The spore density was highest for *Glomus*. It was observed to be a dominant species. High species diversity is an indicator of less vulnerability towards challenging environmental conditions.

Keywords: -Arbuscular Mycorrhiza (AM), *Acaulospora*, *Gigaspora*, *Glomus*, *Scutellospora*.

INTRODUCTION

The present paper deals with investigation of Arbuscular Mycorrhizae in industrially polluted MIDC area of Dombivli in Thane district of Maharashtra, with respect to their association with seasonal changes surrounding fifteen industries of MIDC area, located at Sagarli in Dombivli (East). The mutually beneficial relationship between the feeder roots of plants and fungi is called mycorrhiza. 'myco' meaning fungus and 'rhiza' meaning root (Trappe, 2005). Arbuscular Mycorrhizal (AM) fungi are obligate symbionts and are even found in nutrient deficient soils responsible for the plant growth, plant protection from drought, temperature, and salinity and, for soil quality.

Statement of the problem: The current research deals with identifying dominant species of AM fungi, tolerant to industrial pollution and thereby effectively using such species as potential tools for myco-remediation.

Scope of research: The seasonal survey of AM fungi species will significantly contribute to the field of mycology, ecology, and bioremediation.

Significance of research subject: Isolation and trap culturing of pollution tolerant species of AM fungi can be successfully used as bioremediators, which can successfully uptake heavy metal pollutants, as soil pollution is a part and parcel of industrialization in metropolis. The current research deals with the species composition of AM fungi species adapted for arid and polluted habitats. The heavy metal accumulation by AM fungi is possible with symbiotic plant partner. The metal pollution by AM fungi are often neglected and therefore need to investigate as effective, ecofriendly tool to combat metal pollution in urban zones.

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***In-Vitro* Studies and Multiple Shootlet Induction in *Cyathocline purpurea* (Buch.-Ham. ex D.Don) Kuntze**

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An efficient micropropagation protocol based on multiple shootlet induction has been standardized in *Cyathocline purpurea*, a medicinal plant. The nodal and leaf cuttings were cultured on MS medium supplemented with 0.5 mg/mL BAP, 0.5 mg/mL NAA and a combination of 0.5 mg/mL BAP + NAA. Multiple shootlet induction was observed on MS medium supplemented with the combination of 0.5 mg/mL BAP + NAA using nodal explant. The shootlet thus induced, was 2.5 cm in length and had cotyledonary leaves on it. This shootlet was further transferred to another culture vial containing the same media. Phytochemical screening was done to check the presence of phenolics, steroids, alkaloids, glycosides and flavonoids using three different solvents viz., Petroleum Ether, Acetone and Ethanol. Antibacterial activity was seen against *E. coli*. Antioxidant assay was performed by checking the radical scavenging activity using DPPH.

Keywords: Micropropagation, Multiple shoot, *Cyathocline*, Phytochemical screening, Antioxidant activity.

Abbreviations: BAP: 6-Benzylaminopurine, NAA: Naphthaleneacetic acid, MS medium: Murashige and Skoog (1962) medium, DPPH: 2,2-diphenyl-1-picrylhydrazyl

INTRODUCTION

Plants have played a major role in treating many diseases. Such medicinal plants are exploited commercially in order to get the phytochemicals of interest. Some of the plants being least concerned are often neglected. One of these plants is *Cyathocline purpurea* (Buch.-Ham. ex D.Don) Kuntze., belonging to the family Asteraceae, commonly known as purple bane. It is a sub-erect annual herb, growing upto 50 cm in height. It is viscid and glandular, silky hairy. Basal leaves are radical and cauline, sessile, segments are toothed. Heads measure 0.3 to 0.6 cm across, in terminal corymbose panicles; involucral bracts are linear, acute, margin is hairy. Florets are pale to bright purple. Achenes are oblong (Tambewagh et al., 2017). It is common throughout wet places, also in the forests as undergrowth. It flowers from September to March. This plant has many therapeutic uses including anti

bacterial (Joshi, 2013), antiarthritic (Bihani et al., 2014), anti-inflammatory (Tambewagh et al., 2017), anti-cancer (Ma et al., 2009), anti-oxidant properties (Tambewagh et al., 2017)

In vitro shootlet induction is one of the processes by which plants can be grown *in vitro*, i.e., inside a laboratory. In this technique, plants are grown from isolated plant cells, tissues and organs under axenic conditions to regenerate and propagate entire plants. This technique has become immensely important due to its commercial application in growing various medicinal as well as horticultural plants at a high rate, in less time and land. In the following experiment, shootlet induction was successfully achieved in the Murashige and Skoog media made by the combination of two hormones, viz., NAA and BAP. The shootlet thus produced was transplanted in a media with the same concentration of hormones.

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Synthesis of alkyl levulinate as fuel blending agent by catalytic valorization of carbohydrates via alcoholysis: Recent advances and challenges

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ARTICLE INFO

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ABSTRACT

Alkyl levulinate moieties are recognized as the most attractive and potential energy compounds due to their excellent fuel additive/blending properties and commercial applications. These alkyl levulinates can be efficiently synthesized by the Bronsted and Lewis acid catalytic valorization of carbohydrates through alcoholysis reaction. However, potential production of alkyl levulinate at the industrial scale-up is still a challenging issue which demands for an overview of current research advances in the field to expand the knowledge horizon and scope for the future perspective. With this objective, the present review is planned to emphasize the recent update on (i) catalytic valorization of carbohydrates via alcoholysis, (ii) fuel blending potential of levulinates (iii) factors affecting (catalyst, solvent, feedstock) alcoholysis reaction and (iv) mechanistic view for alcoholysis of carbohydrates. Moreover, this review also emphasizes future prospects in terms of opportunities/challenges for the sustainable production of alkyl levulinate from carbohydrates through alcoholysis.

1. Introduction

Availability of the energy resources is a key factor to govern the economic growth of nation [1]. Moreover, the availability of the energy resources offers security to nation, endorses positive GDP measures, industrial as well as infrastructural development and promotes public standard of living [1,2]. Thus, energy and availability of resources of energy are judged as a fundamental need of modern human society [3, 4]. Currently, the whole globe is majorly depending on the availability of the naturally existing non-renewable fossil fuel resources involving

coal or petroleum or natural gas [5]. Nevertheless, these natural resources are found to be non-adequate to complete the fundamental energy requirement of modern civilization in upcoming years [6]. Moreover, the international tension/ restriction/ sanctions/ war-like situations, geo-politics and limited natural fossil fuel resources cause hasty rise and fluctuation in fuel prices [7].

In present year, several countries are having massive hike in petroleum product/fuel prices, whereas, some countries are almost shut-down attributed to most devastating fuel crisis and having below line energy poverty index [7]. Besides this, the fossil fuels are accountable

Abbreviations: HTC-400-S, Carbonized xerogel dispersed in 98% w/w H₂SO₄; CMK-HPM-50, Phosphomolybdic acid-carbon mesoporous composite catalyst; DPW-CeSiM, Si-Ce-pillared montmorillonite supported Wells-Dawson tungstophosphoric acid (H₆P₂W₁₈O₆₄, DPW); SG-HPW-ZrSiMt-20, Zr-Si-pillared montmorillonite supported tungstophosphoric acid; Al/Mt, Al ion-exchange montmorillonite; 4-HPWFe-MMTSi, Fe-modified tungstophosphoric acid functionalized Si-pillared montmorillonites; Sn/Mt, Sn ion-exchanged montmorillonite; Zr/Al 2-SB, SBA-15 mesoporous silica supported bimetallic Zr/Al catalysts; KITZ20, Mesoporous zirconium silicates; Al-5-SB, Alumina-coated SBA-15 mesoporous silica; SO₄²⁻/ZrO₂-PMO-SO₃H, ZrO₂/organo-silica functionalized mesoporous sulfonic acid; Sn-Beta/HSiW, Combined catalyst Sn-Beta zeolite and heteropoly acid (H₄SiW₁₂O₄₀); Cu-DUSY, Dealuminated copper supported on Y molecular sieves; HPW/H-ZSM-5, Phosphotungstic acid (H₃PW₁₂O₄₀) supported on H-ZSM-5; MZP-Pr-SO₃H, Modified bifunctional mesoporous zirconium phosphate catalysts; ZrY60.5, Acid-base bifunctional zirconia-zeolites; PSDVB-SO₃H, Polycondensed styrene and divinyl benzene sulphonated porous polymer; 5-Cl-SHPAO, Sulphonated and chlorinated hyperbranched poly(arylene oxindole); PD-En-SO₃H, Sulphonated ethylenediamine functionalized mesoporous polydivinyl benzene; SiO₂/C-SO₃H, Sulphonated-silica/carbon; Al-OCS-0.1, Grafted sulfonic acid on oxidized ordered mesoporous carbon loaded with Al₂(SO₄)₃; UCC-S-Fe, Fe-doped sulphonated carbon cryogel catalyst; UFCS-Zn, Zn-doped sulphonated urea furfural carbon cryogel; HDS-3.6, α,α'-dichloro-p-xylene derived hyper-cross-linked carbonaceous catalyst; KCC-1/Al-SO₃H, Si/Al sulphonic acid functionalized on fibrous nano-porous Si particles; 5-sulfosalicylic acid/Ni/NiSO₄, Bifunctional carbon Ni/NiO nano-fiber catalyst based on 5-sulfosalicylic acid; DFNSU, Modified dendritic fibrous nano-silica.

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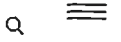


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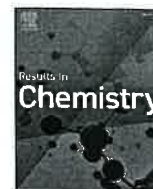
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Highly efficient magnetically separable Zn-Ag@L-arginine Fe₃O₄ catalyst for synthesis of 2-aryl-substituted benzimidazoles and multicomponent synthesis of pyrimidines

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Keywords:

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Pyrimidine
Magnetic Nanocatalyst

ABSTRACT

A general and efficient one pot protocol has been developed for the synthesis of benzimidazoles and pyrimidines using Zn and Ag@L-arginine Fe₃O₄ as a heterogeneous catalyst. The prepared catalyst provided good yields of the corresponding products within a short reaction time. Catalyst was characterized by using XRD, TEM, FE-SEM, EDS, XPS, Raman, CHNS and FT-IR. The present method provided high yields of the products with wide substrates scope. The catalyst could be reused five cycles without a significant loss of catalytic activity.

Introduction

During the last few decades, magnetically separable materials area emerged as notable tool for organic transformations due to their properties like easy separation, recyclability, and nonleaching nature of the catalyst in the reaction medium. These materials are used in a variety of fields, including administration of drugs, magnetic high-density information storage, magnetic resonance imaging, and cancer treatment [1]. Their magnetic features, prevent material loss and increases cost-effectiveness, making them appealing industrial-scale alternatives [2]. Magnetite, a type of magnetic material, is extensively studied for the creation of more environmentally benign reaction protocols, and the field is still productive for research [3].

Magnetic nanoparticle-based materials are being extensively explored as a green chemistry tool in organic synthesis, since they are easy to prepare, cost-effective, and environmentally friendly [4]. Heterocyclic compounds, which are made up of carbon, nitrogen, and oxygen, are used in a wide range of potent drugs. The 2-aryl-substituted benzimidazoles and pyrimidines are found in pharmacologically active compounds and natural products [5,6]. These compounds are extensively used as antiviral, antimicrobial, antibiotic, antifungal, anticonvulsant, antiulcer, analgesic, antihypertensive agents, [7] also light-

emitting devices [8]. Benzimidazole derivatives act as effective fungicides [9] and also exhibit distinct pharmaceutical properties such as Telmisartan as AT₁ receptor antagonists and Rabepazole used in the treatment of gastric ulcers [10,11]. Oxibendazole, Albendazole, and Mebendazole to treat parasitosis, bis benzimidazole derivatives bind with DNA topoisomerase, also cytotoxic against breast adenocarcinoma [12,13]. Tetrahydropyrimidine derivatives exhibit powerful and selective activities on a wide range of membrane receptors [14] and substituted derivatives of tetrahydropyrimidine are valuable building blocks for the synthesis of heterocycles that possess high activities towards cell-permeable antitumor scaffold, Monastrol, and antihypertensive agent (R)[15–17].

As a result, the development of novel synthetic methods for these heterocyclic molecules is crucial. In the last few decades, several elegant strategies for the synthesis of benzimidazoles derivatives have been well established by reacting 1,2 phenylenediamine with aldehyde/ carboxylic acids by using various catalysts such as Fe₃O₄@SiO₂@(CH₂)₃N⁺Me₃[18] clay supported titanium catalyst,[19] lanthanum chloride,[20] NaY zeolite, [21] ceric ammonium nitrate/polyethylene glycol,[22] CoFe₂O₄, [23] DDQ [24]. However, in most of the earlier reports including ferrite and metals supported on ferrite catalysts, have drawbacks like longer reaction times, and high reaction temperatures

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Current Opinion in
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Recent update on use of ionic liquids for enzyme immobilization, activation, and catalysis: A partnership for sustainability

Kirtikumar C. Badgujar^{1,2}, Vivek C. Badgujar³ and Bhalchandra M. Bhanage¹

Abstract

Recent literature survey suggested that, ionic liquid not only possesses potential as a green solvent, but also plays a significant role in enzyme immobilization, activation, stabilization, and catalysis. Furthermore, biocatalysis in ionic liquids (IL) may be a key sustainable solution for the next generation chemical processes, which requisite extensive research efforts to expand the knowledge horizons in this field. In view of this, the present review highlights the recent update of potential applications of IL in biocatalysis for (i) biomass pretreatment/hydrolysis, (ii) enzyme immobilization-activation, (iii) organic transformation, (iv) bioremediation, and (v) biosensing. Moreover, this review also addresses the challenging issues and future outlook of this research area for the industrial development in near future.

Addresses

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Keywords

Ionic liquid, Biocatalysis, Sustainable development, Green chemistry, Enzymes.

Introduction

Enzymes are nature's catalysts while biocatalysis is known as green sustainable catalysis due to outstanding attributes such as, environmental friendliness, mild reaction operating conditions, high product yield through stereo-, enatio-, and regio-selectivity [1]. The biocatalytic reactions show highest activity in the water however,

organic substrates displayed poor solubility in water, which restricts the industrial organic synthetic applications of biocatalysis at large scale [2]. In contrast to this, organic substrates showed better solubility in organic media wherein enzyme showed usually lower activity. Further, use of organic solvents at large scale typically possess non-green limitations such as flammability, volatility, non-safe handling, toxicity, and high cost of solvent recovery/distillation [2]. Based on principles of green and sustainable chemistry, there is a rising attention to develop enzyme compatible water like non-aqueous solvent systems which can stabilize the enzymes for catalytic activity and promote the solubility of organic substrates for transformations [3]. In recent years, the Newton's designer solvent ionic liquids (ILs) have received massive attention in a biocatalytic reaction media, as pretreatment solvent before enzymatic hydrolysis, enzyme immobilization carrier or enzyme activity enhancer in biocatalysis (Figure 1) [4]. Furthermore, enzymes are polyelectrolyte that stabilizes in water, in the same way it might be stabilized in non-aqueous electrolytic media IL [4]. In view of this, we spotlight the recent advances of use of IL in enzyme-catalysis, which may open new opportunities in the field of enzyme activation, stabilization, bioremediation, bio-sensing applications, and biocatalysis. Further this review also highlights the opportunities and challenges for the development of sustainable industrial biocatalysis in IL.

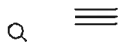
Ionic liquid in biocatalysis: a partnership for sustainable future

The call for green and sustainability is mentioned by United Nations as "Transforming World: The 2030 Agenda for Sustainable Development" that governs ecological, economical, and social as the major factor for sustainable development [5]. The biocatalysis is considered as an industrially attractive methodology for the synthesis of widespread usable organic moieties [6]. The use of biocatalysis offered complete greener protocols (Figure 2A). Along with this greener features, it is notable to mention that, the biocatalysis is must operated only at mild reaction conditions along with high product selectivity, reduction of down-stream processing and hence considered as energy as well as cost saving (economical) [5,7]. Moreover, the biocatalytic approaches have several environmental benefits such as it is obtained from renewable resources and are easily



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Current Opinion in Green and Sustainable Chemistry

Volume 36, August 2022, 100621

Review article

Recent update on use of ionic liquids for enzyme immobilization, activation, and catalysis: A partnership for sustainability

Kirtikumar C. Badgujar^{1,2}, Vivek C. Badgujar³, Bhalchandra M. Bhanage¹

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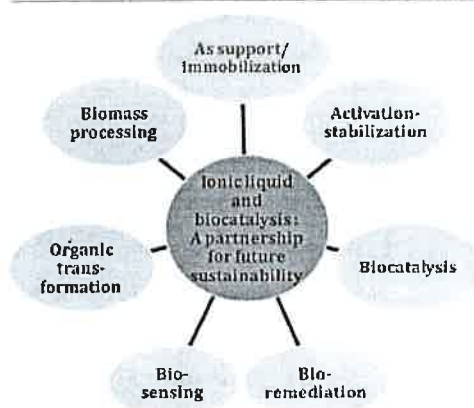
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Abstract

Recent literature survey suggested that, ionic liquid not only possesses potential as a green solvent, but also plays a significant role in enzyme immobilization, activation, stabilization, and catalysis. Furthermore, biocatalysis in ionic liquids (IL) may be a key sustainable solution for the next generation chemical processes, which requisite extensive research efforts to expand the knowledge horizons in this field. In view of this, the present review highlights the recent update of potential applications of IL in biocatalysis for (i) biomass pretreatment/hydrolysis, (ii) enzyme immobilization-activation, (iii) organic transformation, (iv) bioremediation, and (v) biosensing. Moreover, this review also addresses the challenging issues and future outlook of this research area for the industrial development in near future.

Graphical abstract



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Study of (n, p), (n, α) and (n, 2n) reactions of stable and radio-nuclides produced in a reactor environment

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Abstract. The knowledge of the neutron-induced reaction cross-section is important, especially, for the fusion and fission reactor technologies. In the absence of experimental data or for cases where measurements are difficult, theoretical predictions of nuclear cross-sections are needed to be improved upon using refined model calculations or effective semi-empirical formulas. Accurate, physics-based modelling of neutron-induced reactions is key to all nuclear science and technology applications. In the present work, the excitation functions for (n, p), (n, α) and (n, 2n) reactions up to 20 MeV for stable isotopes of Ti, Cr, Mn, Fe, Co, Ni, Cu, etc. are calculated using the EMPIRE-3.2 nuclear reaction model code using optimised values of input parameters. The experimental data available in EXFOR database for these stable isotopes are reproduced to determine the optimum parameters. The optimised parameters, so obtained, are then used to calculate the reaction cross-sections for a series of unstable nuclides for the incident neutron energy of 1–20 MeV. The calculated cross-sections are compared with the evaluated data available in literature (ENDF). We have also compared our results with the estimated cross-sections using available empirical formulas. Based on the calculations, we recommend a reliable set of parameters to estimate the (n, p), (n, α) and (n, 2n) cross-sections for unstable nuclides in the mass region $A \sim 40$ –70.

Keywords. Fast neutron-induced reactions; cross-sections; nuclear data; nuclear reactor; EMPIRE-3.2.

PACS Nos 25.40.-h; 25.85.-w; 28.20.-v

1. Introduction

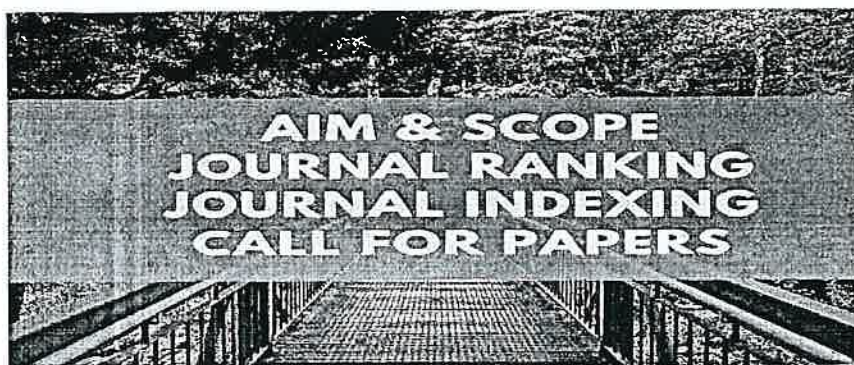
International efforts in a collaborative and co-operative manner are currently being carried out to build the International Thermonuclear Experimental Reactor (ITER). The design of ITER is based on the concept of magnetic confinement of plasma for net fusion energy production [1]. The fusion process can involve different elements in the periodic table. However, the deuterium–tritium (D–T) reaction has been identified as the most efficient reaction for fusion energy production because it produces large amount of energy at lower temperatures compared to reactions with other elements. In the reactor, materials are bombarded by the high-energy (~ 14 MeV) neutrons generated by the fusion of deuterium and tritium in the fusion reactor. Special attention is required for the selection and development of the structural materials of the fusion reactor. The realisation of the dream of fusion energy is largely dependent on the choice of materials suitable to withstand the harsh environment

of high thermal stresses, high heat loads (plasma-facing materials), extreme radiation damage, etc. [2,3]. It is quite challenging to finalise the specifications of materials, their development, characterisation, production and suitable fabrication [4]. To meet the above requirements, stainless steel (SS) and copper alloys are used as structural materials, having Ti, Cr, Mn, Fe, Co, Ni, Cu, etc. as their main constituents (in SS316, the content of Fe is $\sim 65\%$). Table 1 shows the possible compositions of some of these materials, which are not strictly defined, but can vary from time to time depending on the manufacturer [5].

Other than the physical damage, the exposure to high-energy neutron flux also causes isotopic transmutation of the structural material of the reactor. The change in isotopic or elemental compositions can affect the material behaviour and also produce radioactivity. The high neutron energies of about ~ 14 MeV can cause different types of nuclear reactions with the target nuclei, namely, direct reactions, multiparticle emissions from

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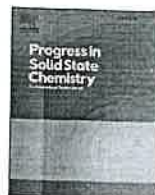




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Recent development of aluminate materials for solid state lighting

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ABSTRACT

Different phosphors emit different wavelengths of light depending upon the doped impurity ions. They have various applications in the technological fields. Therefore, the majority of research is accelerated in terms of energy saving and eco-friendly devices. The enormous and countless research in the aluminate materials have shape up the new era of solid state lighting in terms of illumination, small size, energy saving, long lasting eco-friendly phosphors, etc. Aluminates are the low cost and easily available materials and have the potential to fulfill almost all the properties that are required for illumination. The scientists have accelerated progressively more economical techniques, which are useful for technological advancement as well as mass production of the materials. This article highlights the recent development in aluminate materials in terms of their synthesis process, investigation in crystal structure, crystal field splitting and effect of energy band gap along with luminescence properties and lifetime measurements. Some of the earlier investigations showed the limitations and recent critically challenged investigations have also been discussed in this article. This article also includes various applications of these aluminate materials.

1. Introduction

Inorganic phosphors doped with rare earth ions have achieved a wide range of applications. The different properties of phosphors allow them to cover a wide spectrum of applications from the general illumination to the biomedical sciences [1–3]. The nanotechnology is also a modern era for innovative technology among the scientists and the economists since the technology brings an innovative and sustainable mode of saving energy, long-lasting time and improved performances [4–6]. In the last few years, the material scientists have directed the research towards the transition metal ions and the trivalent rare earth ions in the host matrices in order to design the materials, which have excellent luminescence, thermal stability, high quantum efficiency and outstanding color purity with the reduced particles size and covered with large surface area [6,7]. The applications of these materials in terms of illumination including nano-sized materials involved white light emitting diodes (WLEDs), which require high quantum efficiency and thermal stability [1,2,8]; back light display devices require emission band in the narrow region [9] and the phosphors that converts UV to blue light or green to red emission are useful for the agricultural

applications [10,11]. The luminescence properties of a phosphor depend upon the host and the activators. Therefore, the tuning of host materials with specific activators by different synthesis routes set up the phosphors for different applications [12,13]. Different sorts of trivalent rare earth ions, such as Ce³⁺, Eu³⁺, Tb³⁺, Dy³⁺, Sm³⁺, Pr³⁺ etc. show emissions in the UV and visible regions in different host matrices [14–16]. However, different phases of the host matrices also affect the luminescent properties of the materials [17]. Therefore, the study of crystal configuration is an important aspect of consideration. In order to reach the demand of general illumination and other applications, the phosphors must have to develop strategically, which includes the properties, like finding new host matrix with specific activators, such as Mn⁴⁺ doped fluoride silicates [18–20], Eu²⁺ doped nitrides [12,13,21], selection of activators in different crystallographic sites [22–24], adjusting a synthesis process in order to form a suitable coordination environment around the activator ions [25–27], etc. Recently, the aluminates are in prime approach due to their applications in terms of illuminations. Moreover, the materials used for preparing the aluminates are of low cost and they are simply available. Interestingly, they can easily adapt the required properties.

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संशोधन

जलसंधारण व व्यवस्थापन : महिलांचा सहभाग

मेधा ढापरे
व
रश्मी भुरे

दोन्ही लेखिका अनुक्रमे कीर्ती एम. डूंगरसी महाविद्यालय, दादर, मुंबई आणि एस. आय. ई. एस. कला, विज्ञान व वाणिज्य महाविद्यालय, सायन, मुंबई येथे राज्यशास्त्राच्या विभागप्रमुख आहेत.
dhapremedha16@gmail.com
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जागतिक महिला दिन ८ मार्च २०२३चे घोषवाक्य 'न्याय्यतेची गळाभेट' (Embrace Equity) आणि आंतरराष्ट्रीय जल दिन २३ मार्च २०२३चे घोषवाक्य 'भागीदारी व सहकार्याद्वारे वेगवान बदल' (Accelerating the Change with Partnership and Cooperation) ही आहेत. महिला व पाणी हे परस्परांशी संबंधित आहेत. पाण्याशी निगडित हणान्या वेगवान बदलांमध्ये सर्वसमावेशकता व महिलांना जलव्यवस्थापनामध्ये प्राधान्याने न्याय्य वागणूक अशा रीतीने दोन्ही घटकांची सांगड घालता येते. जलसाक्षरता व जलव्यवस्थापनामध्ये समाजातील विविध घटकांचे सहकार्य व त्यांच्यातील भागीदारीमध्ये महिलांचा सहभाग हे भविष्यकालीन पाणी टंचाईवर मात करण्यासाठी आवश्यक आहे.

पाणी परिमित नैसर्गिक साधन संपत्ती आहे. पाण्याचे पुनर्भरण पावसावर अवलंबून असल्यामुळे ते अनिश्चित स्वरूपाचे आहे. औद्योगिकीकरण व त्यामुळे वाढते शहरीकरण, भूपृष्ठावरील पाण्याची अपधाव (runoff of surface water), भूगर्भातील पाण्याचा अनियंत्रित उपसा, पाण्याची मर्यादित साठवण क्षमता, असमान व अनियमित पाऊस, वाढत्या लोकसंख्येमुळे पाण्याची वाढती मागणी या सर्व बाबींमुळे जागतिक पातळीवर पाण्याचे दुर्भिक्ष्य मोठ्या प्रमाणात जाणवत आहे.

जागतिक स्तरावर पाण्याची उपलब्धता संकुचित पावत आहे. जगातील एकूण पाणीसाठ्यापैकी पशु-पक्षी व मानव यांच्या वापराकरिता फक्त ०.३% शुद्ध व गोडे पाणी उपलब्ध आहे. (National Geographic Society, 2022).

पाण्याशिवाय या जीवसृष्टीचे अस्तित्व धोक्यात येऊ शकते. पाण्याच्या अनुपलब्धतेमुळे तसेच विषम वाटप व वापरामुळे आंतरराष्ट्रीय व आंतरराज्यीय तणाव व संघर्ष निर्माण होतील अशी भविष्यवाणी काही विचारवंतांनी केली होती. त्यापैकी कोफी अन्नान व वंदना शिवा यांचे विचार खालीलप्रमाणे आहेत.

जागतिक जलदिना निमित्ताने (२२ मार्च २००२) संबोधित करतांना संयुक्त राष्ट्र सचिव कोफी अन्नान यांनी असे मत मांडले की, सन २०२५पर्यंत जगातील दोन तृतीयांश लोकसंख्या मध्यम किंवा तीव्र पाणीटंचाई असलेल्या देशांमध्ये राहण्याची शक्यता आहे. जलस्रोतांवरील तीव्र राष्ट्रीय स्पर्धेमुळे पाण्याच्या प्रश्नात हिंसक संघर्षाची बीजे असल्याची भीती निर्माण झाली आहे (Annan, 2002).

पर्यावरणवादी विचारवंत वंदना शिवा यांनी म्हणून 'संघर्ष' १७



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परिवर्तनाचा वाटसरू । १ ते १५ मे २०२३ ३



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ROLE OF INFLUENCER MARKETING IN BRANDING

Dr. Arti Sharma, Assistant Professor, VIVA Institute of Management and Research
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Abstract

The research paper throws light on the intricacies of influencer marketing as an up and coming phenomenon that is becoming crucial to brands in today's economy. With the persistent and formidable increase of screen time among individuals the importance and role of influencers is paramount. Through the following research paper the researcher strives to convey the power of persuasion that influencers today hold given the plight of social media use. Qualitative secondary research approach was utilized to exhibit a conclusive, thorough and pragmatic understanding of influencer marketing. It seeks to present to brands and consumers alike the hold influencers have over their audience and this can be tapped into via suitable means.

Keywords: Influencer Marketing, Brands, Influencer, Influence.

Introduction:

A trending buzzword that is on an upwards journey when it comes to scaling in the online advertising ladder, influencer marketing is a prominent route being taken by brands consciously. With its increasing use in mainstream media, one needs to realize its true meaning and relevance in today's primarily online marketing landscape. Here, it becomes essential to uncover the meaning of influencer marketing and what it substantially entails.

Understanding Influencer Marketing:

Influencer marketing is a hybrid of classic and cutting-edge marketing strategies. It combines the idea of celebrity endorsement with a content-driven marketing strategy. The key difference in influencer marketing is that the campaign's results are collaborations between businesses and influencers. Influencer marketing, on the other hand, isn't just for celebs. In retrospect it revolves around influencers, who are likely not considered to be famous in the most traditional or typical textbook definition of the word.

If one were to define influencer marketing, there are certain intrinsic parameters or identifiers that help one to realize their categorisation. This alludes to the influencers sway or power over affecting the purchase decisions of their, often niche, audience. It boils down to their projected knowledge, trust, authority, and relationship with their specific customers. Another factor to consider in this respect is to realize the influence or impact that a particular influencer yields reflects through the size of their following and the niche that they cater to.

Comprehending The Role of Influencers:

A prominent and common blunder that is prevalent among traditional media agencies is the inability to distinguish between online influencers and typical celebrities. It is also crucial to remember that most if not all influencers have put in significant efforts towards cultivating a loyal and invested following who truly yearn for their influencer's opinion on the subject of their niches. In the case of loyal influencer follower bases, it's a conscious decision to favor the opinions and ideas propagated by the influencer as opposed to the brand created advertisements.

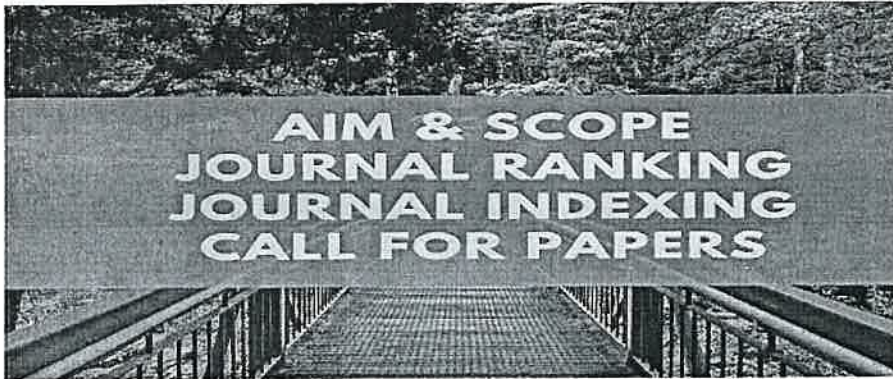
Influencers extend significant effort towards earning the trust of their audience with credible means that can be seen by perusal of their content curation over a stretched-out period of time. Thus, it equates to quality content, with prevailing quality, while maintaining standards and time adhering presence. It checks the curiosity boxes with the help of information delivery to the audience, ensures objectivity and extends reliability in their minds. In the advent of such aware and conscious audiences it is ideal for brands and businesses to pay heed and recognise the power that influencer



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Determination of Antioxidant and Anti-quorum Sensing Activity of *Aegle marmelos*, *Picrorrhiza kurroa*, and *Swertia chirayita*

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ABSTRACT

From the ancient period, humans have been fighting pathogenic microorganisms for survival purposes and in this context, man has developed antibiotics as a powerful weapon to treat various infections caused by pathogens. Nevertheless, the need to discover new antimicrobial agents is increasing at an alarming rate. This is because the microorganisms have developed various mechanisms to resist the action of antibiotics. One such mechanism is the production of biofilm. Infections caused by biofilm-forming pathogenic microorganisms are very difficult to treat, even using potent antibiotics. However, in folk medicine, many plants are found to be helpful to treat certain infectious diseases. This is because of the synthesis of a variety of bioactive compounds by plants with high medicinal value. Hence, in the present study, three different plants were used viz *Aegle marmelos*, *Picrorrhiza kurroa*, and *Swertia chirayita* to determine their antioxidant and anti-quorum sensing activities. According to the literature, antioxidants delay the oxidation process and nullify the effect of free radicals that cause damage and accelerate aging. Quorum sensing is the chemical way of communication between biofilm-forming microorganisms. Among the alcoholic extracts, the methanolic extract of *P. kurroa* showed the highest DPPH radical scavenging activity of 82.11%. All the plant extracts under investigation exhibited anti-quorum sensing activity against the standard culture of *Chromobacterium violaceum* MTCC 2656; however, the plant extracts of *A. marmelos* were found to be more potent as compared to *P. kurroa* and *S. chirayita*. Plant extracts *P. kurroa* and *S. chirayita* showed almost similar anti-quorum sensing activity. This confirms the pharmaceutical importance of plant materials of interest, which might prove to be useful to treat damage caused by free radicals and biofilm-related infections, after due consideration of clinical trials for safety issues.

Keywords: Biofilm; *Aegle marmelos*, *Picrorrhizakurroa* and *Swertia Chirayita*; Antioxidant activity; Anti-quorum sensing activity

1. INTRODUCTION

In today's world, pathogenic microorganisms are one of the serious threats to public health care. Infections caused by these microorganisms are found to be recalcitrant and recurrent due to the ability of the pathogens to acquire resistance against antibiotics used in the treatment. One of the most common mechanisms among the various ways of gaining resistance against antibiotics by pathogenic microorganisms is the formation of biofilm.

Biofilm is an inter/intra-dependent community of surface-associated microorganisms¹. There are five stages of biofilm development which include initial attachment, irreversible attachment, maturation I, maturation II and the final stage of dispersion. Dispersal of cells from the biofilm colony is an essential stage of the life cycle of biofilm. It enables biofilms to spread and colonize on new surfaces, including living tissues and indwelling medical devices like catheters, valves, lenses,

prostheses and so on². Biofilms are majorly responsible for causing persistent, robust, and re-emerging infections because microorganisms within the biofilm are resistant to antibiotics and host immune defence mechanisms. This is overall due to the failure of the antibiotics to penetrate the biofilm, slow growth rate, heterogeneity of the population, physiological changes and the quorum sensing activity of the pathogens. Quorum sensing is the way of communicating and coordinating among the microorganisms involved in the biofilm. It was found that during quorum sensing; microorganisms release signaling molecules called Acyl Homoserine Lactone (AHL) and autoinducers¹.

In developing and underdeveloped countries, traditional medicine plays an important role in providing medical care. Such therapies involve the use of plant extracts or their active principles. This is because plants have been used as a natural source of medicine across the globe. Over the last few years, many plant species have been evaluated for antimicrobial or various biological activities. Indian flora offers huge opportunities for the discovery of potent bioactive compounds with medical application in combating

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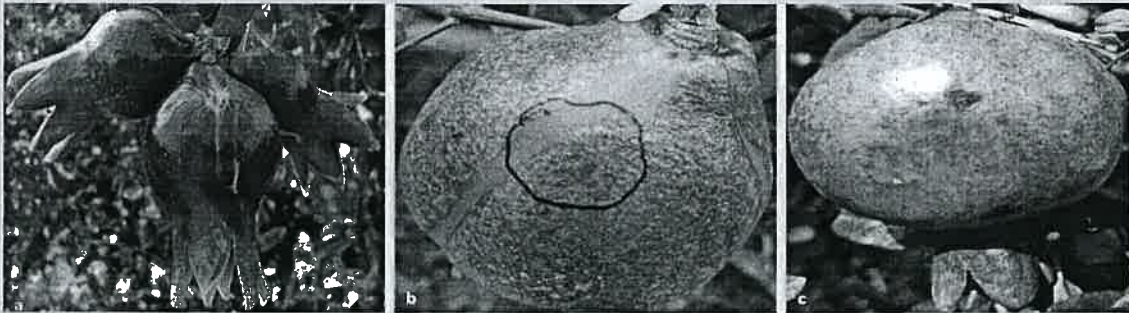
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Defence Life Science Journal

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३. प्रगतिशील परंपरा का प्रतिनिधि कवि: त्रिलोचन

डॉ. दिनेश पाठक

अध्यक्ष - हिंदी विभाग, एस.आई.ई.एस. कला विज्ञान व वाणिज्य महाविद्यालय सायन, मुंबई.

त्रिलोचन का रचनाकाल छायावाद के सीमांत से लेकर इक्कीसवीं शताब्दी के पहले दशक तक फैला हुआ है। रचनात्मक जीवन के इस व्यापक फैलाव में यह स्वाभाविक ही है कि एक रचनाकार का रचनासंसार विविधमुखी व बहुवर्णी हो। त्रिलोचन के साथ भी ऐसा ही है किन्तु इस विस्तार में जो एक स्वर सधा हुआ व अपरिवर्तित बोलता रहा है वह है - प्रकृति और निरंतर कर्म से दीप्त पौरुष से उनका जुड़ावा। इसी ने उनके अंदर के कवि को प्रारंभ से लेकर अंत तक जिलाये रखा और उनकी रचनात्मकता को एक नयी धार दी।

त्रिलोचन का पहला काव्य संग्रह 'धरती' है। धरती की कविताएँ मूलतः प्रकृति और परिवेश के सहज रूप को व्यक्त करनेवाली कविताएँ थीं। इस संग्रह की पहली रचना ही जीवन के सहज रूप को हमारे सामने रखती है -

मुझे जगत जीवन का प्रेमी बना रहा है प्यार तुम्हारा
 मेरी दुर्बलता को हरकर, नयी शक्ति नव साहस भरकर
 तुमने फिर उत्साह दिलाया कर्म क्षेत्र में बढूँ सँभलकर
 तब से मैं अविरत बढ़ता हूँ, बल देता है प्यार तुम्हारा।

त्रिलोचन की ये पंक्तियाँ जीवन के उस रोमानी और निश्छल रूप की अभिव्यक्ति करती है जहाँ मनुष्य को उसका प्यार जीवन के संघर्षों को झेलने उनसे लड़ने व लड़कर उन पर विजय पाने की शक्ति देता है। एक खास उम्र व मानसिकता में पहुँचे हुए व्यक्ति को यह एक निहायत घिसी-पिटी बात लग सकती है किन्तु वास्तविकता यह है कि जीवन की शुरुआत कर रहे व जीवन के संघर्षों में उतर रहे नवयुवक के लिए यह प्यार उसकी शक्ति का वह छिपा हुआ स्रोत हो सकता है जिसके सामर्थ्य का कई बार उसे ही पता नहीं होता।

जीवन की शक्ति को पहचानकर कवि उसके प्रत्येक रूप का स्वागत करता है। उसका प्यार उसे जीवन की सार्थकता का एक नया अर्थ समझाता है और इसलिए कवि त्रिलोचन इस अमूल्य जीवन के राग को गुनगुनाते हुए कहते हैं -

'जीवन मिला है यह/ रतन मिला है यह
 धूल में कि फूल में मिला है/ तो मिला है यह
 मोल-तोल इसका/अकेले कहा नहीं जाता '

जीवन व प्यार पर गहरा विश्वास रखने वाला कवि प्रकृति से गहराई और आत्मीयता से जुड़ा होता है, क्योंकि प्रकृति ही वह शक्ति है जो जीवन व कर्म के प्रति उसके मन में निरंतर आस्था का संचार करती है। प्रकृति के सुंदर-सलौने रूप में डूबकर कवि को एक नई शक्ति मिलती है। त्रिलोचन का कवि भी पूरी गहराई से प्रकृति से जुड़ा है और प्रकृति की विराटता को उसके सुंदरतम रूप में निहारता हुआ जीवन के प्रति सकारात्मक आस्था से भर उठता है। 'धरती' संग्रह में त्रिलोचन की एक कविता 'धूप सुंदर - धूप में जग रूप सुंदर' की एक झलक इस सन्दर्भ में देखी जा सकती है -

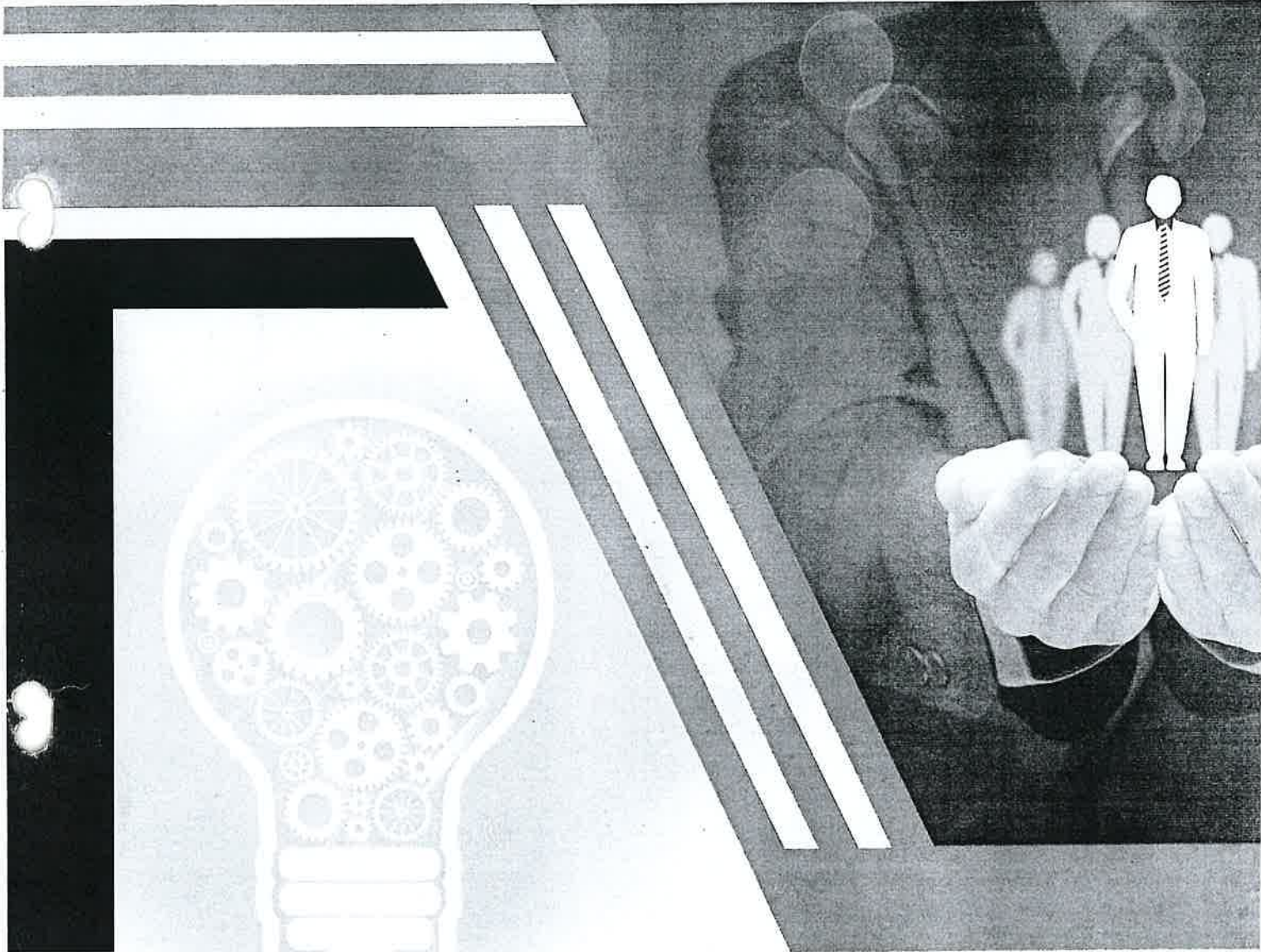


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६. सांस्कृतिक संक्रमण के स्वीकार की चुनौतियाँ और हिंदी प्रवासी कथा साहित्य

डॉ. दिनेश पाठक

सहायक आचार्य एवं अध्यक्ष हिंदी विभाग, एस.आई.ई.एस. कला, विज्ञान व वाणिज्य महाविद्यालय, सायन (प), मुंबई.

हिंदी प्रवासी कथा साहित्य प्रवासी जीवन के लगभग सभी पक्षों पर प्रकाश डालता है। भारतीय हिंदी भाषी प्रवासियों की एक बड़ी संख्या लंदन, अमेरिका और कनाडा में है। इन देशों में बसे रचनाकारों या प्रवासन से गुजर रहे रचनाकारों ने अपने साहित्य में प्रवासी जीवन की तमाम स्थितियों, जीवनसंघर्षों, बदलावों व उन बदलावों को स्वीकार करने की चुनौतियों का यथातथ्य चित्रण किया है।

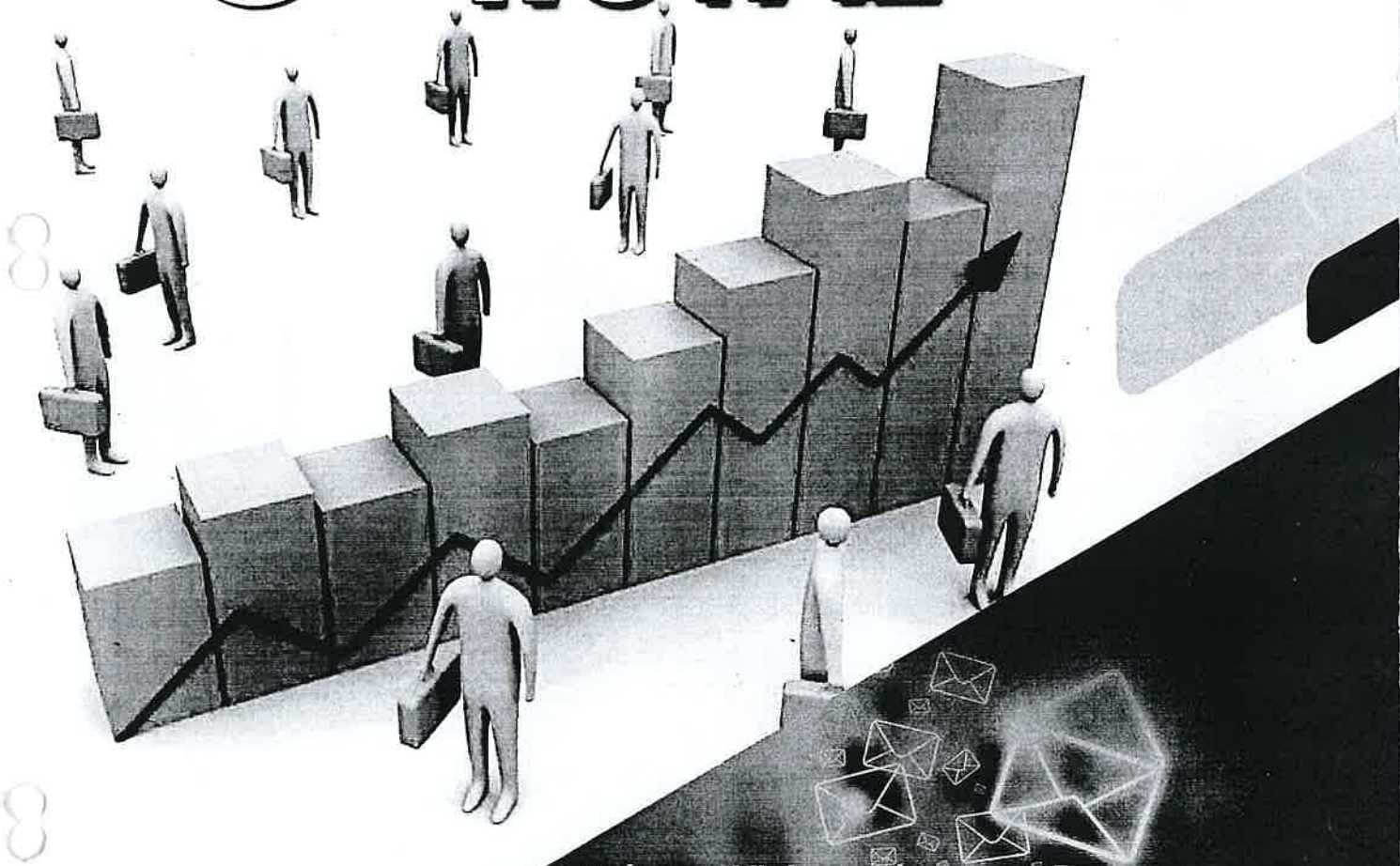
सांस्कृतिक स्तर पर इधर के दशकों में जो चुनौतियाँ प्रवासी जीवन में देखने को मिली हैं, वे असल में दो अलग-अलग पीढ़ियों के द्वंद्व से उपजी समस्याएँ हैं, जिन्हें पुरानी पीढ़ी स्वीकार नहीं कर पा रही है और नयी पीढ़ी स्वीकार करने में बिल्कुल देर नहीं लगाना चाहती है। पुरानी पीढ़ी इसलिए स्वीकार करने से कतराती है क्योंकि अभी उस पर भारतीय संस्कृति के प्रभाव शेष हैं जो नए बदलाव को तुरंत स्वीकार करने नहीं देते या फिर उन्हें स्वीकारने की सीमा का निर्धारण कर एक निश्चित हद तक ही बदलाव की इजाजत देते हैं। चूँकि नयी पीढ़ी पर भारतीय संस्कृति का असर पहली पीढ़ी की तरह ज्यादा स्थायी नहीं है इसलिए वह जिस सांस्कृतिक परिवेश पली-बढ़ी है और रह रही है उसे अपनाते व स्वीकार करने में नहीं हिचकती। इस स्थिति में एक भ्रम का निर्माण होता है। स्वीकार व त्याग में भ्रम की स्थितियाँ पैदा होती हैं और इस स्थिति के कारण सबसे ज्यादा परेशानी युवा पीढ़ी को होती है। वह एक साथ अपने माता-पिता के दबाव को झेलती है तो दूसरी तरफ अपने तरह की जिंदगी जीने की जद्दोजेहद में लगी अपना रास्ता अपनी तरह से बनाना चाहती है। इन स्थितियों का बड़ी बारीकी से वर्णन रवीन्द्र कालिया अपने उपन्यास ए. बी. सी. डी. में करते हैं। उपन्यास का शीर्षक ही इस भ्रम के वातावरण की ओर संकेत करता है। ए. बी. सी. डी. अर्थात् अमेरिका बॉर्न कन्फ्यूज्ड देसी इस उपन्यास में पुरानी पीढ़ी की माँ बार-बार भारतीय संस्कृति की महानता की बात करते हुए अमेरिका को गोमाँस भक्षियों का देश बताती है और अमेरिका में रहने की अनिच्छा जाहिर करती है। इस पर प्रतिक्रिया व्यक्त करते हुए बेटी कहती है, "नागरिकता लेने के लिए न जाने कितने सच्चे-झूठे शपथ पत्र तुमने दाखिल किये थे। मेरा मुँह मत खुलवाओ।" बेटी आगे प्रतिकार करते हुए कहती है "माँ तुम जैसे जानती नहीं कि उसी ऋषि-मुनियों की धरती से छल-छद्म से कितने लोग यहाँ आते हैं। कोई सगी बहन से फर्जी शादी रचाकर चला आता है, तो कोई बहू से। जितनी झूठी शादियाँ और झूठे तलाक यहाँ के हिन्दुस्तानियों के बीच होते हैं,

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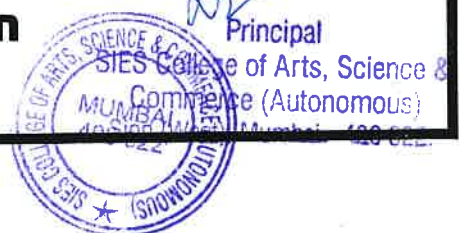
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Abstract

Pakistan factor has played a significant role in India-US relations during the Cold War period. Subsequently, in the post-Cold War era Pakistan began getting de-hyphenated from the India-US relations. Both these democracies strengthened their partnership in the 21st century based on common political, strategic, and economic interest. The article concludes that currently the Pakistan factor though has faded away in India-US relations but has not completely disappeared.

Keywords: India-US Relations, Pakistan, Cold War, Post-Cold War, China.

Introduction

Since its independence, India has witnessed major transitions in the global order. Broadly, India's foreign policy and particularly its bilateral relations with big powers have shaped within this framework of the changing global context. The article begins by examining how India-US relations were hyphenated with Pakistan during the Cold War. It further analyses the change that eventually came in the post-Cold War world order wherein Pakistan started getting de-hyphenated from India-US relations. At the cusp of the new millennium, India-US relations took an enormous leap and started looking at the bilateral relations beyond the lens of Pakistan. The article concludes that the significance of the



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Enhancing Bilateral Connectivity: Recent Developments an Upswing in India-Bangladesh Ties

Abstract

India-Bangladesh relationship is presently on a high trajectory, and connectivity is the buzzword in the bilateral relationship. Connectivity is a game changer for both India and Bangladesh as well as sub-regionalism. This paper will analyse the recent positive developments in railway and inland waterways connectivity between the two countries. Further, it focuses on the areas of concerns and states the need to address the issues in connectivity.

Keywords: *India, Bangladesh, Connectivity, Act East policy, Railway, Inland Waterways.*

Introduction

“Act East” and “Neighbourhood First” have been two continuous and interacting themes in India’s foreign policy during the last decade. Bangladesh, with a unique geopolitical location east of India and in the immediate neighbourhood of India, is vital to the operation of both these policies. Bilateral relations between India and Bangladesh have steadily progressed in the previous decade on many fronts such as political relationship, security cooperation, trade and connectivity, and people to people contacts. There has been a sustained dialogue at all levels, including Summit Meetings, visits of High Dignitaries, foreign secretary level meetings and annual meetings of the Joint Consultative Commission.

Landmark events have occurred in bilateral relations in the recent past. In 2021, Bangladesh celebrated its Golden Jubilee of independence and also marked 50 years of the establishment of diplomatic relations with India. Prime Minister Narendra Modi visited Bangladesh in March 2021 to mark these events and the Birth Centenary of Bangabandhu Sheikh Mujibur Rahman. Followed by this, the President of India too visited in December 2021, to attend the Golden Jubilee of the Victory Day of Bangladesh.

The momentum in bilateral relations has continued even in 2022. The Seventh Meeting of the Joint Consultative Commission, led by the Foreign Ministers of two countries, was held at New Delhi in June 2022. This was followed by the visit of H.E. Sheikh Hasina, Prime Minister of Bangladesh, to India in September 2022 (MEA. India - Bangladesh Joint Statement. 2022).

In the backdrop of this monumental year that has given impetus to the bilateral ties, this paper aims to analyse the recent developments in connectivity between India and Bangladesh within the broader framework of Act East Policy (AEP). Connectivity has several dimensions, like transport connectivity (road, railway, shipping, civil aviation etc.), power and energy connectivity, and data connectivity, etc. This article focuses on railway and inland water transport connectivity.

Impact of partition

Before the partition of India, transportation to and from northern parts of Bengal and entire Assam and North-East Region (NER) was by a modest road and rail infrastructure via East Bengal, which later became East Pakistan and subsequently Bangladesh. With the creation of East Pakistan in 1947, northern Bengal, including Darjeeling and Jalpaiguri and Assam, had become inaccessible by rail except through East Pakistan. The need for a separate line connecting Assam and NER with the rest of India, bypassing East Pakistan, was evident from strategic, political, administrative, and economic perspectives. The Assam Rail Link Project was undertaken, and this link was established in a brief span of three years by January 1950 by linking existing portions of the Oudh-Tirhut Railway (OTR) with isolated sections of the network in Assam and North Bengal. This task was accomplished by construction of four different sections, i.e. Kishanganj in Bihar to Siliguri in Bengal, Siliguri to Bagrakot, Madarihat to Hasimara and Alipurduar to Fakiragram. The existing broad-gauge link between Kolkata and Siliguri which ran through East Pakistan had been disrupted beyond Haldibari and had to be converted to the meter gauge to integrate it with the rest of the network. The rail links between India and East Pakistan ceased to operate after the 1965 Indo-Pak war (Singh, 1951).



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Boosting Road Connectivity In Arunachal Pradesh And Eastern Sector Of LAC

BY DR. RASHMI BHURE

Abstract

Road networks in Arunachal Pradesh have improved considerably in the last two decades. Look East and Act East policies which focus on connectivity have brought huge dividends to the state. Recurring confrontations between the Indian Army and the Chinese PLA at the LAC have added to the urgency of creating better infrastructure in the state, including in border areas. This article analyses the evolution of road connectivity in Arunachal Pradesh from independence to the present day and examines some of its possible long-term consequences in the context of India-China relations.

Keywords: *Arunachal Pradesh, Connectivity, Line of Actual Control, Look East Policy.*

Introduction

After 75 years of India's independence, its borders have remained unsettled and assertive neighbours, be it Pakistan or China, have challenged India's boundaries recurrently. The escalating tensions on line of Control (LOC) and standoffs at Line of Actual Control (LAC) in recent times have been a major cause of security concern for India.

contested by our troops in a firm and resolute manner" (Singh, 2022).

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It is interesting to note that on July 20, 2020 Chief Minister of Arunachal Pradesh Pema Khandu had inaugurated a gompa i.e., a prayer hall for Tibetan Buddhist monks at Chumi Gyatse waterfalls which are in close proximity of the LAC in the Yangtse area and which are considered holy by the Tibetan Buddhists. A new road up to Tsechu village near the falls has been developed by India to promote tourism in the area and to facilitate travel up to the holy site (Hasnat, 2020). The fact that the December clash between the Indian Army and PLA occurred in the same sector of LAC points to the growing border infrastructure created by India as a short-term cause for more provocation by the Chinese.

After the Doklam standoff in June-August, 2017 and the Galwan clash in June 2020, this was the third major reported clash between the two forces on the LAC. In October 2021, there was another face-off, near Yangtse. Differing perceptions of LAC and improved infrastructure on the borders is bringing patrols from both sides into more frequent contact and the potential for more such confrontations in the future exists. Amongst many other strategic, tactical, and political aspects, this clash once again brought into the forefront the issue of border infrastructure in Arunachal Pradesh. Against this backdrop, this article will analyse the recent developments in border road infrastructure in Arunachal Pradesh and their impact on connectivity and security situation in the area.

Historical Perspective

Ever since the 1962 conflict between India and China, the issue of border infrastructure has been vexing the Indian policymakers. India-China border is 3488 km long with 1126 km along Arunachal Pradesh (Ministry of Home Affairs, Management of the Indo-China Border). The Indo-China LAC is divided into three sectors-the Western sector stretches from the east of the Siachen glacier through Aksai Chin to union territory of Ladakh; the Central sector stretches across Himachal Pradesh and Uttarakhand while the Eastern sector runs along the Sikkim and Arunachal Pradesh borders. LAC terrain is mountainous and extremely difficult to access, guard and patrol round the year, especially from the Indian side. Transport and communication networks in the forward areas along LAC in all three sectors have been weak or non-existent for decades.

Lack of a robust road network in Arunachal Pradesh has historical reasons. The area of present-day Arunachal Pradesh was never under the direct control of the great Indian historical empires like the Mauryan, Gupta or Mughal empire, which were centered on the Indo-Gangetic plain. Two great mediaeval empires of Assam, the Sutiya and the Ahoms, did not bring the Himalayan foothills and the tribes living within them under their direct administrative control. Their focus was to protect the agricultural communities in the Brahmaputra plains from frequent attacks by the hill tribes. They did not pursue a policy of conquest of the hills (History of Northeast India (1228 to 1947), 2016).

The area was sparsely populated and inhabited exclusively by hill tribes who had a clear notion of their territory. The tribes lived in isolation and interacted with other tribes only for barter exchange. Bridle paths, mule tracks were the type of road tracks in use in the hills, especially in the upper regions. During the late mediaeval period, Ahom administration placated the tribes in the foothills of Arunachal and started the practice of giving *posa* (which means a right to collect subscriptions for common cause) to hill tribes in return for peace in the plains and largely left the tribes to their own way of life (Acharya, 1992). They did not generally resort to force to completely subjugate the tribes.

The Yandabo treaty of 1826 gave the British control over Assam (Britannica, 1999). The Ahom policy of non-interference in the tribal affairs continued under the British colonial administrators. They gradually ventured into the foothills, initially for exploration of the area and later to establish their authority. The British did not make very serious attempts at administering the hill area, unlike the Brahmaputra Plains, as they did not consider it rewarding enough. The British left the upper hilly regions and frontier tracts untouched. Under British colonial rule, the area of present-day Arunachal Pradesh was first carved out of the province of Assam by way of two frontier tracts in 1919, namely Balipara and Sadiya frontier tracts. These North-East Frontier Tracts (NEFT) were later divided into smaller administrative subdivisions, but within Assam. After independence, the area was designated as North-East Frontier Agency (NEFA) in 1951 (Verrier, 1957). Thus, a modern administration gradually came into being in this remote area in the first half of the twentieth century. Even under the British administration, new roads or the development of existing roads did not happen. For instance, the Gazetteer for East Kameng and West Kameng states that "There was hardly any development of the existing communications or construction of new roads during the British rule". The Gazetteer further records that "There was no motorable road in the three districts of East and West Kameng and Tawang before independence" (Choudhury, 1996). Development of roads under an imperial or colonial administration did not happen in the area for centuries.

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