

మూస సాహిత్య ధార

తెలుగు కథకు ఆధునిక అర్థం - ఉమ్మడి నల్లగొండ జిల్లా  
మౌలిక పరిశోధనకు నిర్వచనం మానవల్లి రామకృష్ణకవి  
ఉలక్ అభిరుచులు - అలవాట్లు  
పరిశోధన స్వరూప స్వభావాలు  
ప్రతిభామూర్తి గంగాపురం హరిహరనాథ్  
రత్నగర్భ తనూజుడు - కారణజన్ముడు  
శాసనముల ద్వారా తెలుగు భాషా పరిణామము

# మూసీ

## MUSI

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## గిరిజనుల బతుకు చిత్రం "బంజారా నానీలు"

వి. వింధ్యవాసినీ దేవి, సహాయాచార్యులు, కె.వి.ఆర్. ప్రభుత్వ మహిళా కళాశాల, కర్నూలు, ఫోన్ : 77

తెలుగు సాహితీవనంలో బంజారా సంస్కృతి సంప్రదాయాల పరిమళాలను వెదజల్లుతున్న రచయిత్రి ఆచార్య సూర్యాధనంజయ్. రచయిత్రిగా, సాహిత్య విమర్శకురాలిగా, ఆచార్యులుగా సుప్రసిద్ధులైన వీరు బంజారాల అస్తిత్వాన్ని వదిలించేసే దిశగా రచనలను వెలువరిస్తున్నారు. అదవి దీర్ఘ ఉనికిని సాహిత్యం ద్వారా రికార్డు చేస్తూ అటు సాహిత్యానికి, ఇటు చరిత్ర, సంస్కృతులకు ఇతోధికంగా దోహదం చేస్తున్నారు. 'సల్లిగొండ జిల్లా బంజారా సాహిత్యం- తీవ్రచరిత్ర' పరిశోధక గ్రంథం, 'తాంగీ', 'గమనం' వ్యాస సంపుటలు, "గోర్ బంజారా ఆన్ ఎన్ థ్యూరింగ్ ట్రిబ్" అంగ్ల గ్రంథం, 'బంజారా నానీలు' గిరిజనుల జీవితాలకు సంబంధించిన అనేక కథలు రచించారు. ఇలా అనేక ప్రక్రియల్లో బంజారాల వాణిని సమర్థవంతంగా వినిపిస్తున్నారు. గిరిజనుల చైతన్య స్వరంగా నిలిచిన ఆచార్య సూర్యా ధనంజయ్ బంజారాల బతుకుచిత్రాన్ని తన రచనల్లో యథార్థంగా అభివ్యక్తం చేస్తూ జగద్విదితం చేస్తున్నారు. "బంజారానానీ"లో తండా ప్రజల జీవనవిధానాన్ని దృశ్యమానం చేస్తూ, నేటి వేగవంతమైన జీవనవేగానికి ఉనికిని కోల్పోతున్న 'తండా' అస్తిత్వాన్ని ఆవేదనాభరితంగా అక్షరీకరించారు. వాగరిక సమాజానికి దూరంగా, అడవుల్లో, కొండకోనలలో నివసించే గిరిజనుల ఆచార సంప్రదాయాలు, సాంస్కృతిక అస్తిత్వం, అలవాట్లు, వేషధారణ, తండావాసుల ఆమాయక మనస్తత్వాన్ని ఎంతో హృద్యంగా కవిత్వీకరించారు. స్త్రీల పట్ల వివక్ష, ఆడపిల్లల అమృతాలు, నిక్షరాస్యత, పేదరికం, వలసలు, వితంతువుల దుర్భర జీవనం, మూఢసమ్మతాలు మొదలైన సామాజికాంశాలను, సామాజిక పరిణామాలను ఈ నానీలో వెల్లడించారు. "వారి చరిత్ర / ఎంతో ఘనమైనది / ఏ మహాకవి / దృష్టి పడాలి!" అంటూ ఘనమైన వారి చరిత్రలోని కొన్ని అపురూప సన్నివేశాలను పాఠకుల ముందుంచారు. మాతృభాష పట్ల నిండైన మమకారం కవయిత్రి సొంతం. ఉపాధి నిమిత్తం ఎన్ని భాషలు నేర్చి, ఎంత ఎత్తుకు ఎదిగినా తన మాతృభాషనే తన శ్వాసగా చెప్పుకోవడాన్ని గమనించవచ్చు. "బంజారా భాష/ నా వృద్ధయ శ్వాస/ కాలమెంత మారినా/ అపురూపం నా యాస" అని గర్వంగా మాతృభాషను గౌరవిస్తూ, ప్రతి ఒక్కరూ మాతృభాషను మరచిపోకూడదన్న సూచన చేశారు. సూర్యా ధనంజయ్ తండాను వీడి చాలా కాలమైనా, నేటికీ బంజారా భాషకు ఆగ్రహంబాలం ఇవ్వడాన్ని గమనిస్తే భాష పట్ల వారికున్న అచంచలమైన అనురక్తి ద్యోతకమవుతుంది.

పరిణామశీలత కలిగిన కాలగమనంలో, ఎన్నో మార్పులకు లోనవుతున్న ఇతర సామాజిక వ్యవస్థలతో పాటూ బంజారా తండాలు రూపురేఖలు సైతం మారుతున్నాయి. బంజారాల జీవనవిధానంలోనూ

ఎన్నో మౌలిక మార్పులుస్తున్నాయి. ఒకప్పుటి తండాలు (బంజారాల నివాస గ్రామం) విచ్చిన్నమవుతున్న సందర్భాన్ని వ్యక్తీకరిస్తూ "నాగరికతారధ్యంలో/తప్పిపోయావు/ ఒ నా తండా/ ఏ అనవాళ్ళిక్కడ?" అని ప్రశ్నించారు. అభివృద్ధి, నాగరికత, పట్టణీకరణ పేర్లతో కనుమరుగవుతున్న తండా అనవాళ్ళను ఈ నానీలో అన్వేషిస్తున్నారు. సమాజం ఎంత అభివృద్ధిబాటలో వయనించినా తమ జాతి మూలాలను మరచకూడదన్న సూచన వ్యక్తమవుతుంది పై నానీలో. ప్రపంచీకరణ వరదలో పడ్డలా, పట్నాలే కాక తండాలు సైతం మునిగిపోతున్నాయన్నది కఠోరవాస్తవం. ఈ వాస్తవాన్ని గూర్చి చెబుతూ "ప్రపంచీకరణం/దేనివి వదల్లేదు/అఖిరికి/తండా సంస్కృతిని కూడా" అంటారు.

తండావాసుల అస్తిత్వ అనవాళ్ళను పట్టించే అంతం వారి ప్రత్యేక వస్త్రధారణ. బంజారా మహిళల వస్త్రధారణ విలక్షణంగా ఉండి అకట్టుకుంటుంది. "అమె కదిలేచ్చే / కళాఖండం/ ఆ ద్రస్సు కుట్టిన/ యాదీని మొక్కాలి", "రంగురంగుల/పేట్కా టుట్టలు/అందాల అల్లికకు/ అమ్మ ఇచ్చిన రూపాలు" అంటూ వారి వస్త్రాల అందాన్ని కవిత్వీకరించారు. ఈ వస్త్రాలను తయారుచేసే ఫ్యాషన్ డిజైనర్లు గిరిజన మహిళలే కావడం విశేషం. ఎంతో అకర్షణీయమైన కాళీ (బంజారాల రవిక) పేట్కా (ఘాగ్రా) వస్త్రాలు ఆధునిక జీవనశైలిలో కనుమరుగై ఆ స్థానాన్ని చీర సొంతం చేసుకుందని "తండా కూడా / నాగరికం వేర్చుకుందే! / కాళీ, పేట్కాలను / చీర ఎత్తుకెళ్ళింది" అంటారు. వారి సంప్రదాయ అస్తిత్వానికి చిహ్నమైన వస్త్రధారణ నేడు ఫ్యాషన్ ద్రస్సుగా మారిందనీ, అయినా అది వారి సంప్రదాయంలో పేరిన మీగడ వంటిదేనన్న భావన వ్యక్తం చేశారు. తండాలు సంస్కృతిని కాపాడాలన్న కవయిత్రి తపన ఈ నానీల్లో వ్యక్తమవుతుంది.

జనావాసాలకు దూరంగా అటవీప్రాంతాలలో ప్రకాంత జీవనం సాగించే తండావాసులకు తగిన జీవనోపాధి లేక వలసల బాట పట్టడాన్ని ఎత్తిచూపుతూ "గుడ్ల నిండా కస్నీళ్లతో/పేడుకోలు/అమె వయనం / పూనా, బొంబాయి వైపు" అంటూ గిరిజనులు వలస వడ్డలుగా మారి, బుక్కెడు బువ్వ కోసం సరిహద్దులను దాటి మహా సగరాలకు వలసపోతున్న విషయాన్ని హృద్యంగా తెలియపర్చారు. అంతేకాకుండా "గిరిజనుడికి రెక్కలే/ పెట్టుబడి/ అందుకే/ వలసల అలజడి" అంటూ గిరిజనుల క్రామిక మనస్తత్వాన్ని, వారి బతుకు వెతలను యథార్థంగా ఆవిష్కరించారు. కల్యణమెరుగని గిరిజన వాసులను, వారి అమాయకత్వాన్ని, అపసరాలను ఆసరాగా చేసుకొని కొన్ని జిషధ కంపెనీలు తమ ఉత్పత్తులకు ప్రయోగశాలగా





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కోవూరు, నెల్లూరు జిల్లా, ఆంధ్రప్రదేశ్, ఇండియా.



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**ఎండపల్లి భారతి కథలు - మహిళ**

- డా॥ వి. విండ్లప్రసాద్ దేవి, తెలుగు అధ్యాపకురాలు ప్రభుత్వ డిగ్రీ కళాశాల, కృష్ణా యూనివర్సిటీ, కర్నూలు.

మానవ జీవితగమనంలోని ఎన్నో సంఘర్షణలు, సంవేదనలు, అనుభూతులు, అనుభవాలు, జ్ఞానకాలు ఇలా అనేకాంశాలు కథలుగా రూపుదిద్దుకుంటాయి. 'కథంచే' మానవ జీవిత అనుభవసారం అని చెప్పొచ్చు. తెలుగులో రాయబడిన చాలికథ నుంచి నేటిదాకా ఎన్నో విభిన్నాంశాలు కథలుగా మలచబడ్డాయి. కథ ఆవిర్భవించిన నాటి నుండి నేటిదాకా వెలువడిన కథలలో మహిళ పాత్రను సృజించని కథలు లేవని చెప్పడం సత్యదూరం కాదు. ఈ కోవలోనే మహిళను కేంద్రంగా చేసుకొని దిగువ మధ్యతరగతి ప్రజల జీవితాలను యధార్థ దృక్పథంతో కథలుగా మలచిన రచయిత్రి, కథానికాత్రి శ్రీమతి ఎండవల్లి భారతిగారు. చిత్తూరు జిల్లా, మదనపల్లి సమీపంలోని దిగువబురుజు గ్రామంలో భారతి గారు జన్మించారు. చదవ తరగతిలోనే బడి చదువు అగి పోయినా, సమాజాన్ని చదవడంలో రచయిత్రి నిత్య విద్యార్థిగానే కనిపిస్తారు. మారుమూల గ్రామీణ ప్రాంతంలో జన్మించిన భారతిగారు తన చుట్టూ ఉన్న సమాజాన్ని, ప్రధానంగా మహిళల జీవితాలను లోతుగా పరిశీలించినట్లు వీరి కథల ద్వారా వెల్లడవుతుంది. గ్రామీణ ప్రాంత బడుగు, బలహీన వర్గాల మహిళల జీవితంలోని అనేక పార్శ్వాలను సూక్ష్మంగా అధ్యయనం చేసి, వారి జీవన స్థితిగతులను కథలుగా రచించారు. నిరుపేద దళిత మహిళల బతుకునెత్తలను కథల ద్వారా వాస్తవికంగా పాఠకుల ముందుంచారు. స్వయంసహాయక సంఘాల కోసం వెలువడే 'నవోదయం' పత్రిక సంపాదక వర్గంలో సభ్యురాలైన కథానికాత్రి, పత్రిక పనికోసం పల్లెల్లో తిరుగుతూ, గ్రామాల్లో మహిళల స్థితిగతులను సంపూర్ణంగా అవగాహన చేసుకుని ఆయా సంఘటనలనే చక్కటి కథలగా మలిచారు.

2008లో 'ఎదారిబతుకులు', 2002లో 'బతుకీత' కథానంపుటులను వెలువరించారు. చిత్తూరు జిల్లా గ్రామీణ మాండలికంలో రాసిన ఈ కథలు పల్లె ప్రే జీవిత గమనంలోని సంఘర్షణను, సంవేదనను ప్రధానంగా చిత్రించాయి. ముఖ్యంగా మహిళ మనస్తత్వాన్ని, రాజకీయ, ఆర్థిక, సామాజిక వ్యవస్థలలో ప్రే స్థానాన్ని, చైతన్యాన్ని, సమాకాలీన గ్రామీణ సమాజాన్ని ప్రతిభావంతంగా చిత్రించాయి. ప్రతి కథనూ అలవోకగా, అతి సాధారణంగా, ఎటువంటి అతిశయోక్తులూ లేకుండా, సహజ గ్రామీణ వాతావరణాన్ని భూమికగా చేసుకొని శిల్పీకరించడంలో రచయిత్రి విజయం సాధించారని పేర్కొనవచ్చు.

ఆధునిక నమాజంలోని మహిళలు సామాజిక కట్టుబాట్లు నుండి, సాంప్రదాయిక వ్యవస్థ ఉక్కుపిడికిళ్ళ నుంచి, పురుషాధిపత్య భావజాలం నుంచి బయటపడి స్వేచ్ఛాయుతంగా తమ జీవితాలను తామే తీర్చిదిద్దు కున్నట్లుగా నేడు మనం భావిస్తున్నాము. అయితే ఇదంతా నాణేనికి ఒకవైపు మాత్రమే అనీ, నేటికీ మహిళల జీవితాలు దుర్భరంగానే ఉన్నాయనీ, ప్రధానంగా ఆధునికత అందని మగువలు కోకోల్లలు అనీ, లింగవివక్షకు, వర్గవివక్షకు గురికాబడుతూ, బతుకు నిత్య సంకటంగా వెళ్ళిపోతున్న అభద్ర స్త్రీల అనుభవాల సారాన్ని ఎండపల్లి భారతి కథలు స్పష్టమరుస్తాయి. ఆధునిక మహిళ చరిత్ర తిరగరాస్తుందన్న మాటేమో గానీ, ఆధునికతకు ఆమడదూరంలో ఉన్న సగటు, సామాన్య, నిరుపేద గ్రామీణ స్త్రీ జీవితంలోని చీకటికొణాలను భారతిగారు వెలుగులోకి తీసుకొచ్చారు. మహిళ మస్తిష్కానికి అద్దంపట్టే కథలను భారతిగారు వెలువరించారు.

**ਅਰੀਖੰਡੀ :**

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### **ROLE OF MICROFINANCE AND SELF-HELP GROUPS IN FINANCIAL INCLUSION**

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# ROLE OF MICROFINANCE AND SELF-HELP GROUPS IN FINANCIAL INCLUSION

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## **Introduction:**

The importance of the rural banking and microfinance in the economic development of a country cannot be overlooked. As Mahatma Gandhi pointed out "Real India Lives in Villages", and village economy is the backbone of Indian economy the existing extensive formal banking structure is still not sufficient to meet the growing demand of rural credit. Financial inclusion is delivery of financial services more especially the banking services at an affordable cost to vast sections of disadvantaged and low-income groups. Financial inclusion aims at drawing the "Unbanked" population into the formal financial system so that they have the opportunity to access financial services ranging from savings, payments, and transfers to credit and insurance. Major commercial banks in India have been nationalized with the objective of establishing a strong financial structure and thereby paving the path for the economic and social development of the nation. It is now widely acknowledged that financial exclusion leads to non-accessibility, non-affordability and non-availability of financial products. Limited access to funds in an underdeveloped financial system restricts the availability of their own funds to individuals and also leads to high-cost credit from informal sources such as moneylenders. Due to lack of access to a bank account and remittance facilities, the individual pays higher charges for basic financial transactions. Absence of bank account also leads to security threat and loss of interest by holding cash. All these impose real costs on individuals. Prolonged and persistent deprivation of banking services to a large segment of the population leads to a decline in investment and has the potential to fuel social tensions causing social exclusion. Thus, financial inclusion is an explicit strategy for accelerated economic growth and is considered to be critical for achieving inclusive growth in the country.

Micro Finance is a hard term to define precisely. If a Self-Help Group gives money to someone to buy a cycle rickshaw it is considered micro finance, if a commercial bank does the same thing it is not considered micro finance. In India, the term is generally understood to mean small loan given to the poor by NGOs to start small business. The world over, microfinance is synonymous with the Grameen bank in Bangladesh. In Bangladesh, Micro finance arose in direct response to failure of the nationalized commercial banks to cover the needs of the poor and marginalized.

  
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## HURDLES NEED TO BE CROSSED TOWARDS FINANCIAL INCLUSION IN INDIA

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### Abstract

A recent research reveals that one third of the world's poorest people live in India and also human development index shows 135th Place in the world. Being second most populated and third economically emerging country in the world, Indian statistics shows 28% of Indian population suffers from poverty and hunger. Inclusive growth will lead to eradication of poverty by providing equal opportunities and economic participation. Since 1991 various reforms have been introduced in India. Even though only a few have access to basic financial facilities, most of the poor were tapped by private microfinance institutions and money lenders. This emerge the concept of Financial Inclusion in India to distribute financial benefits to all. Financial Inclusion is a major economic development tool, it not only provides financial protection to the under privileged but also adds to the process of capital formation of the country. As 12th five year plan says faster, sustainable and inclusive growth is only possible with economic participation of all. Financial Inclusion is a process of delivering basic financial services at an affordable cost to vast sections of poor or economically disadvantaged groups. RBI and GOI pays joint efforts towards financial inclusion in India; however it was not achieved yet. Being a largest populated and developing country India faces problems. It is possible only with well implemented policies and adoption by end user. In this entire process Information and Communication Technology plays a vital role. This paper will further focus on initiatives taken by Government of India and Reserve Bank of India towards Financial Inclusion. Need and major hurdles in implementing Financial Inclusion in India with existing financial institutions make propose some suggestions.



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**Key words:** Financial Inclusion, inclusive growth, Government of India, Reserve Bank of India, World Bank (IBRD), International Monetary Fund, National Sample Survey Office.





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# **TRENDS, OPPORTUNITIES AND CHALLENGES IN DIGITAL ECONOMY OF INDIA**

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## **ABSTRACT**

The digital economy is the worldwide network of economic activities, commercial transactions and professional interactions that are enabled by information and communications technologies (ICT). It can be succinctly summed up as the economy based on digital technologies. Digital Economy refers to an economy that is based on digital technologies. The growth, integration and sophistication of information technology and communications is changing our society and economy. Digital technology in the form of the Personal Computer and the Internet has already transformed work, education, government, entertainment, generating new market opportunities and having a major economic impact across a broad range of sectors. In the ICT of the digital economy, India appears to have comparative advantage to grow to global stature.

**KEYWORDS:** Digital economy, Communications, Technology and Opportunities

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## **INTRODUCTION**

Digital Economy refers to an economy that is based on digital technologies. The digital economy is also sometimes called the Internet Economy or Web Economy. The digital economy became the model global economy as the last stage for the devolvment of the economy and it considers as a result of using the information technology in different economic fields, such as what happened in all our life activities. No doubt, the digital economy has the risks and problems of Security and Privacy which are more in the case of India subject to internal and external risk. The roll out of e-Government services in India is currently lightly well, but policies of digital inclusion should play an advanced role in this development, in order to encourage the bridging of the 'digital divide'. Limited availability of Internet infrastructure, High cost of access and usage, Lack of awareness and low digital literacy, Narrow range of applications and services and unfavourable business environment. he Government of India has also been pushing for rapid digitization, leading to increasing investments in the IT sector. In the recent Union Budget of 2022-23, the Government of India has made a few announcements which will lead to some major developments in India on the digitization front. Apart from direct digitization in banking, higher education, and health sector, the country will soon have its own Digital Currency issued by the Reserve Bank of India, the country's apex bank. Also, the government has announced that datacentres will be given infrastructure status in the country allowing it to play a key role in enabling a digital economy. Multicolour adoption will be on the rise, and so will cybersecurity vulnerabilities. Together 2022 will be an interesting year with technologies playing the lead roles in our lives. India will be the largest





## "Tribal development-welfare schemes"-An overview in the post independent India

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### Abstract

Except for Africa, India has the highest concentration of tribal people anywhere on the planet. The tribes are natural offspring, and their way of existence is influenced by the ecology. India's diverse ecosystems result in a diverse tribal population across its length and breadth. The tribal-inhabited areas make up a substantial portion of the country's underdeveloped areas. The tribal population is largely concentrated in small villages or hamlets. In addition to towns and cities, a smaller section of their people has now resided in permanent villages. According to approximate estimations, the significant tribal territories account for around 15% of the country's entire geographical area. Tribal groups the weakest segment of India's population is made up of castes and de-notified tribes. Tribal tribes interacted with non-tribal Hindu caste communities, but remained essentially distinct from the social framework. The Ministry of Tribal Affairs is implementing a number of development schemes aimed at achieving holistic development for tribals, with an emphasis on convergence of multiple development programs.

**Keywords:** community development program (CDP), national extension service (NES), education, poverty, Income, living standards, development

### Introduction

Soon after independence, the Indian government concentrated on the country's total development, including industries, large dams, mining, and other developmental projects, in order to strengthen the economy through five-year plans. Apart from that, the government was also concerned with tribal issues, and as a result, several policies and programs for the development of the tribal population as a whole were developed. The framers of the constitution recognized the necessity for special treatment for the scheduled tribes and drafted the constitution accordingly, allowing for the creation of a developmental framework for India's poor.

According to the 1991 census, 67.76 percent of people in various states and union territories, except Assam, Jammu, and Kashmir, are members of the Scheduled Tribe (ST). This equates to 8.08 percent of the entire population. The percentage of people who belong to a Scheduled Tribe has grown slightly from 7.83 percent in 1981 to 7.95 percent in 1991. During the decade of 1981 to 1991, the population of Scheduled Tribes rose by 25.67 percent. In compared to the country's overall population, the growth rate is considerable (23.79 percent). This chapter provides an overview of India's tribal development policies, strategies, and projects.

Out of the overall Scheduled Tribe population of 67.76 million, about 49 percent dwell in three states: Madhya Pradesh (27.73 percent), Maharashtra (1 0.80 percent), and Orissa (1 0.38%), whereas Haryana, Punjab, Chandigarh, Delhi, and Pondicherry have no Scheduled Tribe population.

Approximately 93 percent of Scheduled Tribes live in rural areas. Only three states, namely Karnataka, Maharashtra, and Tamil Nadu, have more than 10% of their Scheduled Tribe population living in rural regions, with percentages of 14.94, 12.47, and 12.01 respectively. Andhra Pradesh (7.6%), Assam (3.4%), Bihar (7.0%), Gujarat (8.1%), Kerala (3.5%), Madhya Pradesh (4.8%), Orissa (5.1%), Rajasthan (4.6%), Uttar Pradesh (5.9%), and West Bengal (5.9%) are the states with the highest proportion of Scheduled Tribes in the overall population (5.2 percent).

The tribals are generally found in the sparsely inhabited areas of the sub-Himalayan hills and forests, in the north-eastern region, in the central Indian mountain belt between the Narmada and Godavari rivers, and in the southern sections of the Western Ghats ranging from Wayanad to Kanyakumari. Even now, there is a significant divide between tribals and non-tribals.

The Indian constitution established tribal welfare programs by include essential measures. These clauses not only put a stop to the pre-independence policy of apathy, but also testified to tribal welfare programs, making them a constitutional requirement for future administrations of the country.

### Provisions by the Indian Constitution

It applies to all tribal people and all locations in the United States having a tribal population.

Scheduled Tribes: Social Security and Social Insurance Tribal Welfare: Planning, project formulation, research, evaluation, statistics, and training Promotion and development of voluntary tribal welfare efforts Development of

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## Impact of developmental programs on tribals with special reference to Telangana state

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### Abstract

Tribal territories and people are at the bottom of the human development index in every state and district. On a worldwide scale, natural resources are being depleted, resulting in widespread poverty among indigenous peoples. The effects of planned developmental intervention on tribals have no visible impact from 1961 to 2020. No one can deny that India's tribals are among the world's poorest. Regardless of national poverty estimates, tribal faiths in India have more than 65 percent of the population living in poverty, with the exception of the north-east states, and tribal regions are the most underdeveloped and undeveloped in India. The bulk of these projects, whether they include forests, enormous dams, or massive mineral discoveries, are designed to benefit non-tribals at the expense of local tribals. Local tribal women should be included in health education, with advice from health experts. A well-balanced diet rich in iron and minerals, as well as hundred percent vaccines, can enhance the nutritional and health status of pregnant tribal women. The growth of poultry and fisheries should be encouraged. For their forest goods, the tribe should be compensated fairly.

**Keywords:** tribals, human development, poverty, peoples, forest, education, status, growth, tribal women

### Introduction

The term "tribe" refers to a "categorization of human social groupings." In anthropology, the term tribe has a specific meaning. India and Africa have the world's biggest tribal populations. The numbers are staggering: The tribal lands of India, which are classified into 533 tribes and account for around 10% of the country's population, are home to over 80 million people. Indian tribes have a strong connection to environment and live in some of the country's most beautiful and natural locations. They are a humble and frequently interesting people who, although being mostly undisturbed by modernity, have maintained their traditions and rituals.

The word "tribe" was employed throughout the time of ancient city states and the early establishment of the Roman Empire. The Latin term "tribus" has been translated as "a group of humans creating a community and claiming descent from a common progenitor." The Scheduled Tribes of India may be traced back to races such as the Proto-Australoids, who previously controlled India, the Mongolians, who are still present in Assam, and, to a lesser extent, the Negritos Strain, which is indicated by frizzy hair among the Andamanese and Kardars of South-West India. A scheduled tribe is defined by primitive traits, distinct culture, geographical isolation, shyness of engagement with the rest of the world, and backwardness.

The world's largest tribal population is found in India and Africa. The figures are staggering: there are over 80 million tribals in India, divided into 533 tribes, accounting for almost 10% of the country's population. Tribes in India have a deep connection to environment and live in some of the country's most beautiful and natural settings. They are a simple and often fascinating people who have maintained their rites and customs while being mostly unaffected by the modern world.

Around 80% of them live in the 'central belt,' which stretches from Gujarat and Rajasthan in the west to Maharashtra, Madhya Pradesh, Chhattisgarh, Bihar, Jharkhand, and Orissa in the east, and West Bengal and Tripura in the west, passing through Maharashtra, Madhya Pradesh, Chhattisgarh, Bihar, Jharkhand, and Orissa in the east. Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, and Sikkim, as well as the union territories of Dadra and Nagar Haveli, Andaman & Nicobar, and Lakshadweep in northeastern India, account for the remaining 20% of the population. In the southern states of Kerala, Tamil Nadu, and Karnataka, a small number of them live. Andhra Pradesh, or Telangana, has the largest tribal population among India's southern states.

### Tribals in Indian sub-continent

Adivasis refers to the Tribes of the Indian subcontinent, who are considered India's original people. They were preceded by Dravidians and Indo-Aryans.

It refers to "any of the various ethnic groups thought to have been the original occupants of the Indian subcontinent." In India, however, tribes are not recognized as indigenous people.

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# Effect of Radiation Absorption on Non-linear Convective Heat Transfer of CuO-Ethylene Glycol Nano Fluid past Stretching surface with Variable Viscosity, Hall Effect and Partial Slip

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**Abstract :** We analyze impact of radiation absorption, nonlinear radiation, dissipation, variable viscosity effect, thermo-diffusion and Hall current on the hydromagnetic free-convective flow, heat and mass transfer flow of Ethylene based CuO-nanofluid past a stretching surface in the presence of heat generation/absorption source. Fifth-order Runge-Kutta-Fehlberg method is employed to solved non-linear, coupled equations governing the flow. The effects of various parameters on the velocity, temperature and nanoconcentration as well as on the local skin friction coefficient, local Nusselt number and local Sherwood number are presented graphically and discussed.

**Keywords:** Ethylene Glycol-CuO nano fluid, Convective Heat and mass transfer, Stretching Surface, Variable viscosity, Hall effect, Partial slip

## 1. INTRODUCTION

Cooling capabilities of heat transfer equipment have been constrained because of the low thermal conductivity of conventional coolants including water, oil and ethylene glycol. It is well known that thermal conductivity of metals is very high as compared to that of liquids. Thus one of the effective approaches to enhance heat transfer performance is via dispersing tiny metallic particles of nanometer dimensions in the liquids. Choi [11] was the first to introduce the terminology of nanofluid. The ongoing research ever since then has extended to utilization of nanofluids in microelectronics, fuel cells, pharmaceutical processes, hybrid-powered engines, engine cooling, vehicle thermal management, domestic refrigerator, chillers, heat exchanger, nuclear reactor coolant, grinding, machining, space technology, Defense and ships, and boiler fine gas temperature reduction [Agarwal et al. [3]]. Indisputably, the nanofluids are more stable and have acceptable viscosity and better wetting, spreading, and dispersion properties on a solid surface [Akbarinia et al. [4], Nguyen et al. [23]]. Several reviews [Ghadimi et al. [12],] on nanofluids with respect to thermal and rheological properties have been reported.

Thus, nanofluids have an ample collection of potential applications in electronics, pharmaceutical processes, hybrid-powered engines, automotive and nuclear applications where enhanced heat transfer or resourceful heat dissipation is required. These are nanoparticles clustering, Brownian motion of the particles, molecular level layering of the liquid/particles interface and ballistic heat transfer in the nanoparticles. Despite a vast amount of literature on the flow of nanofluid model proposed by Buongiorno [9], we are referring to a few recent studies [Alsaedi et al. [7], Hajipour and Dehkhordi [13], Rana and Bhargava [28]] in this article. However, we are following the nanofluid model proposed by Tiwari and Das [34], which is being used by many current researchers [Hamad and Ferdows [13], Hamad and Pop [15], Norifah et al. [24]] on various flow fields.

To predict the heat transfer rate accurately, it is necessary to take the variation of viscosity with temperature into consideration. The variation of viscosity in thermal boundary layer is large. There exist several applications of this problem, for example, in the processes of hot rolling, wire drawing, glass fiber production, paper production, gluing of labels on hot bodies, drawing of plastic films and the study of spilling pollutant crude oils over the surface of seawater. Many researchers have studied the flows with temperature dependent viscosity in different geometries and under various flow conditions (Rahman and Salahuddin [27]). To accurately predict the flow and heat transfer rates, it is necessary to take into account the temperature-dependent viscosity of the fluid. The effect of temperature-dependent viscosity on heat and mass transfer laminar boundary layer flow has been discussed by many authors (Mukhopadhyay et al. [19], Mukhopadhyay and Layek [20], Ali [6], Makinde [17], Prasad et al. [26], Alam et al. [5]) in various situations. They showed that when this effect was included, the flow characteristics might change substantially compared with the constant viscosity assumption. Salem [30] investigated variable viscosity and thermal conductivity effects on MHD flow and heat transfer in viscoelastic fluid over a stretching sheet. Xi-Yun Tian et al. [36] investigated the 2D boundary layer flow and heat transfer in variable viscosity MHD flow over a stretching plate. Makinde [18] studied hydromagnetic flow with variable viscosity and thermal radiation. Sreedevi et al. [32] have studied the convective heat and mass transfer flow CuO-water nanofluid past a stretching surface with variable viscosity and Hall effects.

The thermal-diffusion effect, for instance, has been utilized for isotope separation and in mixture between gases with very light molecular weight (Hydrogen-Helium) and of medium molecular weight (Nitrogen-air) the

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# Effect of Non-Linear Thermal Radiation and Partial slip on Unsteady MHD Flow of a Nanofluid Past a Permeable Stretching Sheet through a Porous Medium with Suction/Injection, convective Heat Transfer

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## Abstract

We discuss the effect of non-linear thermal radiation on the boundary layer flow of a thermophoretic magnetohydrodynamic dissipative nanofluid over an unsteady stretching sheet in a porous medium with space and temperature dependent internal heat source/sink. The governing equations are transformed to ordinary differential equations by using similarity transformation. Numerical solutions of these equations are obtained by using the Shooting Technique. The effects of non-dimensional governing parameters on the velocity, temperature, concentration profiles, friction factor, Nusselt and Sherwood numbers are discussed and presented through graphs and tables. We observed that the Radiation parameter ( $R_d$ ) to enhance the velocity, temperature profiles, heat and mass transfer rates of the fluid and reduce the concentration profiles. An increase in slip parameter ( $A_{11}$ ), reduces the velocity, enhances the temperature and nano-concentration.  $\tau$ ,  $Nu$  and  $Sh$  reduce with increasing  $R_d$  &  $A_{11}$  on  $\eta=0$ . Accuracy of the results compared with the existing ones. Excellent agreement is found with earlier studies.

**Keywords:** Non-linear thermal radiation, MHD, Brownian motion, Thermophoresis, Non-uniform heat source/sink, Dissipation, Stretching surface, Newtonian cooling.

## 1. Introduction

Heat and mass transfer of thermophoretic magnetohydrodynamic flow has significant applications viz., air cleaning, aerosol particles sampling, nuclear reactor safety, micro electronics manufacturing etc. Derjaguin and Yalamov [5] have analysed detailed analysis of thermophoretic flows. Goren [10] discussed the boundary layer flow of thermophoresis of aerosol particles over vertical flat plate. Choi [4] has introduced the term "nanofluid". He has given clear description about the heat transfer characteristics of nanofluids. Thermophoresis effect on aerosol particle deposition over a flat plate was analyzed by Tsai [25]. The heat and mass transfer of MHD thermophoretic flow over flat surface has been analysed by Chamka and Issa [3].

  
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Original Article

## A Note on Full k-Ideals in Ternary Semirings

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## ABSTRACT

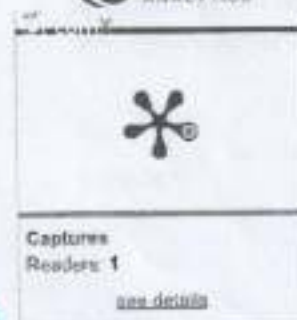
**Objectives:**  $k$ -ideals plays a vital role in ternary semirings. Ternary algebraic systems is a generalization of algebraic structures and it is the most natural way for the further development, deeper understanding of their properties. **Methods:** We have imposed Integral Multiple Property (IMP) and some other different constraints on a ternary semiring. **Findings:** In this study, we have described more results on the full  $k$ -ideal in the ternary semirings. Finally, we provide the characterization of full  $k$ -ideal in ternary semirings and studied their related properties. **Applications:** The structures of ideals in ternary semirings are widely applicable to computer sciences, dynamical and logical systems, cryptography, graph theory and artificial intelligence.

**Keywords**



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## Voltage control using Arduino with Buck Boost converter system

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### Abstract:

The voltage depends on the output load totally. The output voltage can be depends on the buck converter and boost converter. The Arduino Nano used here to give the PWM to the converters. A problem obtained is to convert the desired voltage level according to desired requirements. The development of power electronic circuits can be solving these problems by using a DC-DC converter topology. The input of these converters is an unregulated DC voltage, which is mostly obtained by photo voltaic system and therefore it will fluctuate due to changes in radiation and temperature which in turn, changes the average output voltage. In this Project, the main aim of this research is converting the input DC voltage value to the constant output DC voltage value. These values are measured using voltage sensor and result will be displayed in LCD display and all these devices are interface with Arduino Nano. This module features the MT3608 2 Amp step up (boost) converter, which can take input voltages as low as 2V and step up the output to as high as 28V. The MT3608 features automatic shifting to pulse frequency modulation mode at light loads. It includes under-voltage lockout, current limiting, and thermal overload protection.

**Index terms:** Arduino nano, MT3608 Boost converter, LCD display, Jumper wires, Voltage sensor, Arduino IDE,

  
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### 1.Introduction:

The main objective of a buck-boost converter is to receive an input DC voltage and output a different level of DC voltage, either lowering or boosting the voltage as required by the application[1]. A buck-boost converter is a type of SMPS (Switch-Mode Power Supply) that uses the same concept of both a buck converter and a boost converter, but in one combined circuit. The main objective of a buck-boost converter is to receive an input DC voltage and output a different level of DC voltage, either lowering or boosting the voltage as required by the application[2]. The design of a buck-boost converter is similar to a buck converter and boost converter, except that it is in a single circuit and it usually has an added control unit. The control





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## RFID and GSM based book finder for Libraries using Arduino

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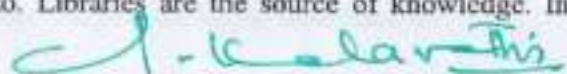
### Abstract:

GSM & RFID Library book availability & location finder system is very essential for digital libraries. RFID system is now very important because it play a very essential role to reduce human efforts. For find the location of each & every book we need to implement RFID tag. User sends the message to GSM modem. This message is accept by Arduino board & pass it to RFID Reader through level converter. RFID Reader pass that code to RFID Card. RFID Card reads that message & message is transfer to RFID Reader, then Arduino board send that message with alert SMS if book is available then alert SMS will be stop. Libraries are very important aspects for humans. They are essential in acquiring and retaining the knowledge of a person. But the earlier library system has caused many problems. This project helps to identify the large number of tagged books using radio waves. The database shows the availability of the book in the library so that the student can search in the database and if available, they can collect book from the library.

Index terms: Arduino nano , RFID Module & Cards, GSM module, LCD Display, Arduino IDE

### 1. Introduction:

Currently, technological developments are developing rapidly and are starting to replace conventional systems that already exist, one of which is a technological Radio Frequency Identification (RFID) system. One application of the RFID system is applied to the library. The application that is commonly used today for smart libraries is the application of the RFID system. With this RFID system it is expected that library visitors can carry out various activities more quickly, effectively and safely. The research to be conducted by the authors aims to create a smart library system that utilizes RFID technology for the book management process. Therefore, in this research the author will design an RFID-based smart library system using the Arduino Nano. Libraries are the source of knowledge. In libraries a thousands of books are

  
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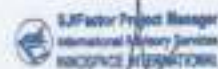
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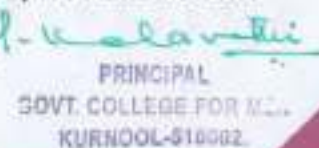
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**IN SILICO ANALYSIS OF 2-CYANO-3-HYDROXYBUT-2-ENAMIDE DERIVATIVES OF AMINOHYDROXYBENZOIC ACIDS, AMINO BENZOIC ACIDS AND AMINOPHENOLS** 147 – 152

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**RECENT ADVANCES AND EMERGING TRENDS ON ZnS NANOPARTICLES**<sup>1</sup> M.Zahir Ahmed, <sup>2</sup>Dr. Shushat Bose<sup>1</sup> Research Scholar, Department of Physics, Sri Satya Sai University of Technology & Medical Sciences, Sehore, M.P.<sup>2</sup> Research Guide, Department of Physics, Sri Satya Sai University of Technology & Medical Sciences, Sehore, M.P.**ABSTRACT:**

Nanoparticles are fascinating to scientists because they act as a link between bulk materials and atomic or molecular structures. A bulk material should have constant physical properties independent of size, however size-dependent traits are frequently observed at the nanoscale. As a result, as a material's size approaches the nanoscale and the percentage of atoms on its surface becomes substantial, its properties alter. The fraction of atoms at the surface of bulk materials greater than one micrometre (or micron) is negligible in comparison to the number of atoms in the bulk of the material. This article highlights about the recent advances and emerging trends on ZnS nanoparticles.

**Keywords:** ZnS, Nanoparticles, Earth ions, Atoms.

**INTRODUCTION:**

Nanomaterials are currently arousing a great deal of interest in the exploration of fundamental features in the nanoscale regime, and timely attention and efforts are required for the transfer of these novel findings into new technologies and products. The well-researched technological revolution may become a reality, and technologies for fabricating nano-structures and nano-materials have been investigated. Bottom-up and top-down approaches can be used to categorise various processing and synthesis techniques. By assembling individual building blocks, the bottom-up technique allows for the synthesis of massive polymer molecules, resulting in bulk material. Crystal growth is responsible for the formation of species in a desired crystal structure from atoms, ions, or molecules in a bottom-up method.

**IMPORTANCE OF NANOPARTICLES:**

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**"Advanced accident prevention system using Arduino"**

Authored by :

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## Advanced accident prevention system using Arduino

<sup>1</sup> Dr. M. Zahir Ahmed, Lecturer in Physics, Government College for Men, Kurnool, A.P., India

<sup>2</sup> Dr. Mohammed Waaiz, Lecturer in Physics, Silver Jubilee Government College (A), Kurnool, A.P., India


### Abstract:

This proposed work is based on accident prevention using Arduino by accessing the engine, driver condition or attention, and distance between the vehicle and obstacle. In this we use different types of sensors to prevent the accident sensors are temperature sensors or heat sensors for identifying the heat of the engine when the engine got over heated then by using alarm or buzzer it will notify the driver still if they don't stop the engine then the engine will automatically stop, Eye blink sensor is used for finding the alertness of the driver when the driver closes his eyes for 5 seconds then it will alert the driver by using the alarm or buzzer still if the driver didn't respond or opened the eyes then the engine will be automatically stopped, ultrasonic sensor is used for finding the distance between the vehicle and obstacle when the vehicle speed is over 20kmph if it's found any obstacles in front the vehicle then the engine will automatically stops.

**Index terms:** Arduino Nano, Eye blink sensor, DHT11, Ultrasonic sensor, LCD display, L293D motor driver, 300RPM DC motor, Arduino IDE

### 1. Introduction:

The overall view of this paper is to develop Temperature monitoring and alert system. The system is used to measure physical parameters such as temperature and humidity of vehicle engine. For safety, comfort, performance, and reliability reasons, modern vehicles keep track of a variety of variables and quantities using sensors and integrated systems. The road accident rates are increasing day by day due to large numbers of vehicle running on the road[1]. In all these Vehicles, the speed control need to be implemented. Here is the new idea of ours to install an automated speed control system in the vehicles to control the speed mainly in the restricted areas like school, college zones etc.. When the vehicle enters the speed limiting zone, the colour sensor detects the colour of the strips which is painted on the road before entering the speed limiting zone. Then the speed is controlled by the speed controlling system to restricted limit[2]. The current speed of the vehicle is sensed by the dc

  
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## Analysis of Noise cancellation techniques in Microphones using LMS and NLMS

<sup>1</sup>Dr. Mohammed Waaiz, Lecturer in Physics, Silver Jubilee Government College (A), Kurnool, A.P., India

<sup>2</sup>Dr. M. Zahir Ahmed, Lecturer in Physics, Government College for Men, Kurnool, A.P., India

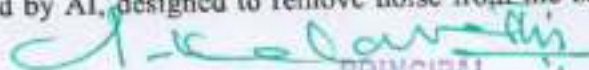
### Abstract:

The system is based on microphones that "listen" to the sounds outside and inside of the earphone, an ANC chipset inverting the sound waves and a speaker inside the earphone cancelling the outside sound by the neutralising sound waves. A bit like taking +2 outside and adding -2 inside to make zero. Adaptive Active Noise Cancellation uses microphones and speakers to automatically adjust to your surroundings. This paper reviews the past and the recent research based on adaptive noise cancellation system using Adaptive filter algorithms. In many applications, the change in the received signals could be very fast which requires the use of adaptive algorithms that converge rapidly. This paper deals with cancellation of noise in speech signal using Least Mean Square (LMS) adaptive algorithms that provides efficient performance with less computational complexity. The NLMS algorithm considerably improves speech quality with noise suppression levels of up to 13 dB, while the LMS algorithm is giving up to 10 dB. In different ways of SNR measure was under various types of blocking matrix, step sizes and various noise locations. The adaptive noise cancellation system assumes the use of two microphones. A primary microphone picks up the noisy input signal, while a secondary microphone receives noise that is uncorrelated to the information bearing signal, but is correlated to the noise picked up by the primary microphone. Adaptive Active Noise Cancellation uses microphones and speakers to automatically adjust to your surroundings. This is the more sophisticated type of ANC where the level of noise cancelling digitally adapts to the surroundings. Active Noise Cancellation (ANC) uses a noise cancelling system to reduce unwanted background noise.

**Index terms:** SNR, ANC, Microphones, LMS, NLMS

### 1. Introduction:

One common adaptive filter application is to use adaptive filters to identify an unknown system, such as the response of an unknown communications channel or the frequency response of an auditorium, to pick fairly divergent applications. Other applications include echo cancellation and channel identification[1]. The present real-time noise suppression technology is powered by AI, designed to remove noise from the background automatically.

  
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**Dr. M. Zahir Ahmed**

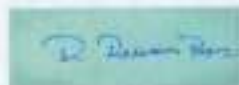
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## Implementation of noise cancellation techniques in Amplifiers using RLS

<sup>1</sup> Dr. M. Zahir Ahmed, Lecturer in Physics, Government College for Men, Kurnool, A.P., India

<sup>2</sup> Shaik Abdul Muneer, Lecturer in Physics, Osmania College (Autonomous), Kurnool, A.P., India

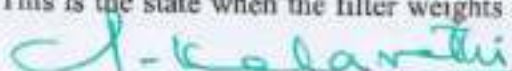
### Abstract:

The system is based on amplifies The principle of noise-canceling is to generate the noise signals with the opposite phase polarities in different paths and finally to cancel the noises at the output, which this technique is used to avoid strong relationship between the input resistance and the noise figure. Adaptive Noise Cancellation Using RLS Adaptive Filtering. By using an RLS filter to extract useful information from a noisy signal. The information bearing signal is a sine wave that is corrupted by additive white gaussian noise. Here using a SPICE simulations and a noise calculator. In this paper finally, it will cover the inclusion of footprints for a feedback capacitor and isolation resistor to help fine-tune noise performance. In this paper we aim to propose a design which can minimize the noise.

**Index terms:** RLS, Amplifiers, RLS, Noise cancellation

### 1. Introduction:

Noise cancellation system using neural oscillators to filter out the background noise of vibration in meshing plastic gear pairs for detection of failure signs of the gears is explained. Least mean squares (LMS) algorithms represent the simplest and most easily applied adaptive algorithms[1]. The recursive least squares (RLS) algorithms, on the other hand, are known for their excellent performance and greater fidelity, but they come with increased complexity and computational cost. In performance, RLS approaches the Kalman filter in adaptive filtering applications with somewhat reduced required throughput in the signal processor. Compared to the LMS algorithm, the RLS approach offers faster convergence and smaller error with respect to the unknown system at the expense of requiring more computations[2]. Note that the signal paths and identifications are the same whether the filter uses RLS or LMS. The difference lies in the adapting portion[3]. The LMS filters adapt their coefficients until the difference between the desired signal and the actual signal is minimized (least mean squares of the error signal). This is the state when the filter weights converge to optimal values, that

  
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## Real time Environment Monitoring and alert System Using Arduino

<sup>1</sup>Shaik Abdul Muneer, Lecturer in Physics, Osmania College (Autonomous), Kurnool, A.P., India

<sup>2</sup>Dr. M. Zahir Ahmed, Lecturer in Physics, Government College for Men, Kurnool, A.P., India

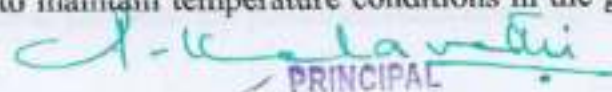
### Abstract:

To monitor the Alcohol, Benzene, CH<sub>4</sub>, LPG, iso-butane, CO, Temperature and humidity, smoke, benzene, vapors using IoT technology. Here in paper implement the design of an operative prototype based on IOT concepts for real time monitoring of different environmental and hazardous gases conditions using available and low-cost sensors. The distinctive natural conditions like temperature, air contamination like Benzene, CH<sub>4</sub>, LPG, iso-butane, CO, Temperature and humidity, smoke, benzene are consistently checked, process and constrained by an Arduino board with ESP01 wifi module the assistance of individual sensors this data is circulated through internet with an ESP8266 Wi-Fi module and monitored in Blynk 2.0 Cloud application in smartphone. This prototype is used to monitor real time data used by graphical information of environment.

Index terms: Air quality, MQ2, MQ6, MQ135, DHT11, Blynk 2.0, LCD display, ESP01, Arduino nano

### 1. Introduction:

This study discusses about temperature monitoring system in the goat pen via smart phone. Gas Sensor(MQ3) module is useful for gas leakage detection (in home and industry). It is suitable for detecting Alcohol, Benzene, CH<sub>4</sub>, Hexane, LPG, CO. Due to its high sensitivity and fast response time, measurements can be taken as soon as possible. In addition to monitoring, temperature control is also needed to maintain temperature conditions in the goat pen. This system is

  
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## RFID and GSM based book finder for Libraries using Arduino

<sup>1</sup>Dr. M. Zahir Ahmed, Lecturer in Physics, Government College for Men, Kurnool, A.P., India

<sup>2</sup>K.Lakshmana Gupta, Lecturer in Physics, Government College for Men, Kurnool, A.P., India

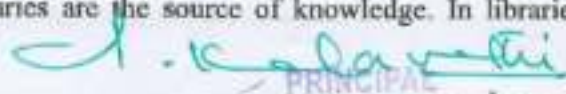
### Abstract:

GSM & RFID Library book availability & location finder system is very essential for digital libraries. RFID system is now very important because it play a very essential role to reduce human efforts. For find the location of each & every book we need to implement RFID tag. User sends the message to GSM modem. This message is accept by Arduino board & pass it to RFID Reader through level converter. RFID Reader pass that code to RFID Card. RFID Card reads that message & message is transfer to RFID Reader, then Arduino board send that message with alert SMS if book is available then alert SMS will be stop. Libraries are very important aspects for humans. They are essential in acquiring and retaining the knowledge of a person. But the earlier library system has caused many problems. This project helps to identify the large number of tagged books using radio waves. The database shows the availability of the book in the library so that the student can search in the database and if available, they can collect book from the library.

Index terms: Arduino nano , RFID Module & Cards, GSM module, LCD Display, Arduino IDE

### 1. Introduction:

Currently, technological developments are developing rapidly and are starting to replace conventional systems that already exist, one of which is a technological Radio Frequency Identification (RFID) system. One application of the RFID system is applied to the library. The application that is commonly used today for smart libraries is the application of the RFID system. With this RFID system it is expected that library visitors can carry out various activities more quickly, effectively and safely. The research to be conducted by the authors aims to create a smart library system that utilizes RFID technology for the book management process. Therefore, in this research the author will design an RFID-based smart library system using the Arduino Nano. Libraries are the source of knowledge. In libraries a thousands of books are

  
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**"Voltage control using Arduino with Buck Boost converter system"**

Authored by :

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## Voltage control using Arduino with Buck Boost converter system

<sup>1</sup> K.Lakshmana Gupta, Lecturer in Physics, Government College for Men, Kurnool, A.P., India

<sup>2</sup> Dr. M. Zahir Ahmed, Lecturer in Physics, Government College for Men, Kurnool, A.P., India

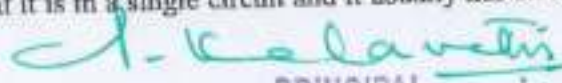
### Abstract:

The voltage depends on the output load totally. The output voltage can be depends on the buck converter and boost converter. The Arduino Nano used here to give the PWM to the converters. A problem obtained is to convert the desired voltage level according to desired requirements. The development of power electronic circuits can be solving these problems by using a DC-DC converter topology. The input of these converters is an unregulated DC voltage, which is mostly obtained by photo voltaic system and therefore it will fluctuate due to changes in radiation and temperature which in turn, changes the average output voltage. In this Project, the main aim of this research is converting the input DC voltage value to the constant output DC voltage value. These values are measured using voltage sensor and result will be displayed in LCD display and all these devices are interface with Arduino Nano. This module features the MT3608 2 Amp step up (boost) converter, which can take input voltages as low as 2V and step up the output to as high as 28V. The MT3608 features automatic shifting to pulse frequency modulation mode at light loads. It includes under-voltage lockout, current limiting, and thermal overload protection.

**Index terms:** Arduino nano, MT3608 Boost converter, LCD display, Jumper wires, Voltage sensor, Arduino IDE,

### 1.Introduction:

The main objective of a buck-boost converter is to receive an input DC voltage and output a different level of DC voltage, either lowering or boosting the voltage as required by the application[1]. A buck-boost converter is a type of SMPS (Switch-Mode Power Supply) that uses the same concept of both a buck converter and a boost converter, but in one combined circuit. The main objective of a buck-boost converter is to receive an input DC voltage and output a different level of DC voltage, either lowering or boosting the voltage as required by the application[2]. The design of a buck-boost converter is similar to a buck converter and boost converter, except that it is in a single circuit and it usually has an added control unit. The control

  
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# CHARACTERISATION, ANTIBACTERIAL AND ANTICANCER INVESTIGATION OF GREEN SYNTHESIZED SILVER NANOPARTICLES UTILIZING GYMNEMA SYLVERSTRE LEAF BROTH (PODAPATHRI) BY MICROWAVE LIGHT STRATEGY

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<sup>✉</sup>Corresponding Author: [utknor@gmail.com](mailto:utknor@gmail.com)

## ABSTRACT

The AgNps are synthesized by green strategy using GMMS plant leaf extract (podapathri plant leaves extract). By excretion of microwave irradiation method, the GMMS plant leaf extract which can act as reducing and stabilizing agent. The development of Ag Nanoparticles was primarily confirmed by altering the color from colorless to yellow. The synthesized Ag Nanoparticles are showing positive antibacterial activity against *Staphylococcus aureus*, *Klebsiella pneumonia*, *Bacillus subtilis* and *Escherichia coli* bacteria were contemplated. The synthesized AgNps divulge virtual anticancer activity on HeLa cells (A549). The particles are very much isolated from one another and did not display any accumulation; this shows the powerful covering nature of GMMS plant leaf extrication (the Podapathri plant leaves separate). Further incorporated AgNps thoroughly characterized by Ultraviolet visible spectra, Fourier Transferred infrared spectra (FT-IR), X-Ray diffraction spectroscopy (XRD), Scanning electron microscopy (SEM), Energy dispersive X-ray investigation (EDS), Transmission electron microscopy (TEM) and Dynamic light dispersing assessment (DLS). The crystalline shape of Ag Nanoparticles is clear from XRD examines. The shape and size of the blended Ag Nanoparticles were examined by TEM studies. The Ag Nanoparticles Size appropriation scatter and the normal size of Ag NPs were discovered to be  $18 \pm 2$  nm in size.

**Keywords:** Green Synthesis, Ag Nanoparticles, GMMS (Gymnema Sylvestre) Plant Leaf Extract, Antibacterial, Anticancer Activity.

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## INTRODUCTION

In the past decade, nanoparticles played an important role in philosophical knowledge and automation because of their particular shape, size, trademark properties and extensive scope of possible applications.<sup>1</sup> Metal nanoparticles having significant electronic,<sup>2</sup> substance and optical Properties.<sup>3</sup> In the midst of the few metal nanoparticles, Ag Nanoparticles have huge consideration of science due to their Individual properties such as peasant surface Plasmon resonance (SPR). The noble metal NPs such as Ag has a vital job in biological and medicinal Area.<sup>4</sup> AgNps are having a huge scope of uses in various fields such as sensor technology,<sup>5</sup> medical, industrial, thermal, optical, electrical, biological, and food processing method.<sup>6</sup> There are different strategies for the synthesis of AgNps, such as chemical reduction, biological Reduction photo-induced reduction and green methods.<sup>7</sup> Among all these green syntheses is the significant and most utilized method for the synthesis of metal nanoparticles, a green synthesis is a novel approach and an alternative to other chemical methods, and it is the most demanding thing for controlling the systems and processes.<sup>8</sup> Since it is a rapid, non-toxic, renewable and Eco-Friendly method (without using any harsh conditions).<sup>9</sup>

Plant material containing Biomolecules is reasonable for a steady and eco-accommodating combination of Ag nanoparticles, in this green, synthetic procedure, the GMMS leaf plant separate is utilized as a reducing and stabilizing agent for the reduction of silver ions into Ag stable NPs.<sup>10</sup> Gymnema Sylvestre is an enduring woody plant local to tropical Asia, China, the Arabian Peninsula, Africa, and Australia.<sup>11,12</sup> It



## In Vitro, Characterization, and DNA-binding Studies of Synthesized Gold Nanoparticles using Orange (*Citrus sinensis*) Peels Extract

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### ABSTRACT

Orange (*Citrus sinensis*) peel is one of the most underutilized biowastes. Most of the orange peels powders are the natural bleaching agent and it is the best source of Vitamin "C." The orange peel extracts acting as reducing and stabilizing agent for the metal nanoparticles, the orange fruit peels are enriched with different natural resources and it conveniently synthesizes the gold nanoparticles (AuNps) under microwave irradiation for 5 min (450 watts). The synthesized AuNps show strong UV-visible absorption at 534 nm, the green synthesized AuNps further optimized by Fourier-transform infrared spectroscopy, HR-scanning electronic spectroscopy, and HR-transmission electronic microscopy, X-ray diffractive spectroscopy, zeta potential, etc.

**Key words:** Green synthesis, Gold nanoparticles, Orange (*Citrus sinensis*) peel extract, DNA-binding studies.

### 1. INTRODUCTION

Nanotechnology is quite possibly the most trend setting innovations in every one of the spaces of science, because of the critical distinction in nature properties of nanoparticles and these properties (e.g. organic, reactant movement, mechanical properties, electrical conductivity optical absorption, thermal, and melting point) [1]. All these properties are dependent on size, shape, and distribution of nanoparticles [2,3]. In addition, nanotechnology and science are a broad and interdisciplinary area for researcher and scientist, nanotechnology-based substances are now found with a wide range of household products and product intended for professional uses [4], including sports gear, cosmetic sunscreen lotions, food packaging materials, clothing and paints, disinfectants, and medicine [5,6]. Among All the metal nanoparticles Gold Nanoparticles (AuNps) are essential in various field, AuNps have more impact of researchers and scientific; the uses of AuNps are potential for drug delivery and medical field [7,8]. The orange (*Citrus sinensis*) peel extract acts as both reducing and stabilizing agents, hence, the orange peel extract can directly reduce  $\text{HAuCl}_4$  to form AuNps without adding external reducers and stabilizing agent [9]. There are a few strategies incorporate obvious AuNps such as synthetic decrease, electrochemical, photochemical, and sonochemical and so forth be that as it may, these techniques are unsafe as they generally require the utilization of poisonous synthetic substances which lead to the natural poisonousness or organic perils [10,11]. To forestall the adverse consequences of the compound decrease techniques, specialists were intrigued to coordinate "green science" combination of nanomaterials using plant separates [12], biosurfactants, in watery medium and so on green amalgamation of AuNps has been accounted for utilizing an assortment of phytochemicals, including *Gymnema sylvestre* leaf extract, pomegranates, and *Scygium* peel extract [13]. Here, green synthesis of AuNps is attempted using orange (*C. sinensis*) peels extract act as reducing and stabilizing agent. The orange peel extract is a naturally occurring phytochemical extracted from the plant (*C. sinensis*), a native tree of India [14]. This (*C. sinensis*) is utilized in customary Ayurvedic and Unani clinical arrangements for the treatment of mitigating, hepatodefensive, hypotensive infirmities,

and as a cell reinforcement and is likewise utilized for the treatment of asthma and loose bowels [15]. The present study reports the synthesis of AuNps with orange (*C. sinensis*) peel extract acting as the reducing and stabilization agent [16]. The synthesized nanoparticles were characterized by UV-visible (UV-Vis) spectroscopy, Fourier-transform infrared spectroscopy (FTIR), X-ray powder diffraction (XRD), HR-scanning electronic spectroscopy (SEM), and transmission electron microscopy (TEM) techniques. These AuNps were also studied for their applications of DNA-binding studies, average size calculation by XRD, and thermal stability counting using UV-Vis spectrometry.

### 2. EXPERIMENTAL SECTION

#### 2.1. Materials and Methods

Chloroauric acid ( $\text{HAuCl}_4$ ) was purchased from Sigma-Aldrich for reliable grade of purity without further purification, nitric acid is purchased from Aura Chemicals Laboratories for the cleaning of glass wear. In this entire reaction, double-distilled water ( $\text{DD H}_2\text{O}$ ) is used for purity without further purification and the orange (*C. sinensis*) peels extract. This consists higher medicinal values, orange fruit peels are collected from the local market of Osmania University, Hyderabad.

#### 2.2. Preparation of Orange (*C. sinensis*) Peels Extract

The orange (*C. sinensis*) peels are naturally available phytochemicals, bicomponents. This is basically cheap [17], easily available, and non-toxic and it has potential application in human disease therapy. Almost 15 g of orange (*C. sinensis*) peels are cut into small pieces and dried under hot air woven at  $80^\circ\text{C}$  for 30 min and powdered it [18]. From

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## Validated UV Spectrophotometric Methods for the Simultaneous Estimation of Omeprazole and Domperidone

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### ABSTRACT

A simple, precise, and accurate method is developed and validated for the simultaneous evaluation of Omeprazole (OME), Domperidone (DOM) in complex formulations (combined dosage form) using UV spectrophotometric methods. The method 1 developed is dual-wavelength method, measures the difference in the absorbance of the mixtures at wavelengths whereas single drug has the same absorbance and vice versa. Mean centered ratio method which depends on the construction of calibration by dividing spectra of the one compound with the other is reported as Method 2. The method 3 is derivative spectrum method, depends on zero-crossing points of the derivative spectrum, which enables the construction of calibration for the two drugs in the presence of second one. Simultaneous estimation of OME and DOM by the Q-absorption method and simultaneous equation method is already reported. To maintain the identical conditions throughout the experiment, the two methods Simultaneous equation method (Method 4) and the Q-Absorption method (Method 5) are repeated. All the five methods are tested for accuracy, precision by six replicate experiments and recovery studies using known synthetic mixtures. The calibrations are used for the analysis of two drugs in the tablet. The methods are validated in terms of ICH guidelines.

**Key words:** Omeprazole, Domperidone, Simultaneous equation, Q-Absorption, Derivative spectrum, Dual wavelength, Mean centered ratio method.

### 1. INTRODUCTION

#### 1.1. Omeprazole (OME) Sodium

Omeprazole (OME) IUPAC name is 5-methoxy-2-[[[4-methoxy-3,5-dimethyl-2-pyridinyl] methyl] sulfinyl]-1H-benzimidazole. It acts as a proton pump inhibitor. It is used in the dyspepsia treatment and is used to treat peptic ulcers, laryngopharyngeal reflux, and syndrome and is used in cure gastroesophageal reflux disease. In peptic ulcers, by specific inhibition of the  $H^+/K^+-ATP$  as in the gastric cell, OME suppresses the secretion of gastric acid. OME blocks the acid production by acting on the proton pump, which reduces gastric acidity. UV spectrometry [1,2], visible spectrometry [3], TLC [4,5], and a variety of analytical techniques involving HPTLC [4], HPLC [6], electrochemical [7], and polarographic [8,9] techniques have been reported in the literature.

#### 1.2. Domperidone (DOM)

DOM is an anti-sickness medicine. DOM IUPAC name is 5-chloro-1-[1-[3-(2,3-dihydro-2-oxo-1H-benzimidazol-1-yl)propyl]-4-piperidinyl]-1,3-dihydro-2H-benzimidazol-2-one. It is an antiemetic used to relieve nausea and vomiting and promotes lactation in women. It also acts on the digestive tract and increases the movement of the intestines. It helps in the treatment of indigestion. It is a specific blocker of dopamine receptors. Literature survey revealed that UV [10-15], HPLC [16,17], RP-HPLC [18,19], and LC-MS [20] methods have been developed.

Literature survey shows that different methods such as UV Spectrophotometry [21,22], HPLC [23,24], RP-HPLC [25,26], and FT-IR [27] are developed in combined dosage forms. There are only two references available for simultaneous determination of

dosage forms by UV spectroscopy using simultaneous equation and Q-Absorbance Ratio methods. However, there is no dual-wavelength, Mean centered ratio (MCR) spectra and derivative spectrum methods for the simultaneous estimation of OME and DOM in a combined formulation. Although methods such as dual wavelength method, derivative spectrum method, and MCR spectra offer sensitive, simple and accurate methods for simultaneous estimation of drugs. Simultaneous determination using the above methods has not reported yet. This prompted the authors to carry out the work in these lines. The successful results are obtained and communicated in this article. Structures of both the drugs were mentioned in Figure 1.

### 2. MATERIALS AND METHODS

#### 2.1. Instrument Used

A double beam Elico UV-Visible spectrophotometer of model- SL 210 with a pair of 1cm matched quartz cells and UV-PC software 4.01.01 version was used.

#### 2.2. Pure Samples

OME sodium and DOM were procured from Hetero drugs Pvt. Ltd. To prepare all the solutions, distilled water was used.

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## FABRICATION OF NANO CLAY INTERCALATED POLYMERIC MICROBEADS FOR CONTROLLED RELEASE OF CURCUMIN

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### ABSTRACT

**Objective:** The objective of this study was to formulate and evaluate the Curcumin (CUR) encapsulated sodium alginate (SA)/badam gum (BG)/kaolin (KA) microbeads for controlled drug release studies.

**Methods:** The fabricated microbeads were characterized by fourier transform infrared spectroscopy (FTIR), differential scanning calorimetry (DSC), thermogravimetric analysis (TGA), X-ray diffraction (XRD), and scanning electron microscopy (SEM). Dynamic swelling studies and *in vitro* release kinetics were performed in simulated intestinal fluid (pH 7.4) and simulated gastric fluid (pH 1.2) at 37 °C.

**Results:** FTIR confirms the formation of microbeads. DSC studies confirm the polymorphism of CUR in drug loaded microbeads which indicate the molecular level dispersion of the drug in the microbeads. SEM studies confirmed the microbeads are spherical in shape with wrinkled and rough surfaces. XRD studies reveal the molecular dispersion of CUR and the presence of KA in the developed microbeads. *In vitro* release studies and swelling studies depend on the pH of test media, which might be suitable for intestinal drug delivery. The % of drug release values fit into the Korsmeyer-Peppas equation and *n* values are obtained in the range of 0.577-0.664, which indicates that the developed microbeads follow the non-Fickian diffusion drug release mechanism.

**Conclusion:** The results concluded that the CUR encapsulated microbeads are potentially good carriers for controlled drug release studies.

**Keywords:** Sodium alginate, Badam Gum, Kaolin, Curcumin, Microbeads, Drug delivery

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### INTRODUCTION

A drug delivery system is designed to allow a therapeutic agent to be introduced into the biological organism and to enhance its effectiveness and safety by controlling the release rate, time and place of drug release in the body [1]. The development of effective therapeutic drug delivery systems is essential for medicine and health care in order to increase the safety, efficacy, and bioavailability of the drugs. Over the past few decades, polymeric matrices are used in many pharmaceutical applications because it offers various advantages like efficiency in administering the drug to the specific target at a proper time thereby improving the overall therapeutic response of a dosage form, high water absorption tendency and capable of swelling under physiological conditions [2-4]. Hence, the utility of polymeric materials is increasing day by day as the pharmaceutical industry expands globally. Now-a-days, Polymeric interpenetrating polymer network hydrogels have been widely used in biomedical applications such as drug delivery and tissue engineering due to their water intake capacity, biocompatibility, and biodegradability [5]. However, IPN hydrogels dosage forms have few drawbacks like uncontrolled swelling and release rate, which leads to several side effects. The polymeric networks are crosslinked with several crosslinking agents, coated with other polymers and intercalated with clay minerals, which control the release and swelling rates. Presence of clay minerals in polymeric matrices, minimizing side effects and maintaining the effective drug concentration in plasma over a period of time [6].

From the last few decades, clay minerals are used in solid and semisolid pharmaceutical preparations for topical and oral administration, as well as cosmetic formulations [7, 8]. Kaolin is a hydrated two-dimensional (2D) aluminosilicate clay mineral, used as active ingredients due to their uninjured bioactivity and therapeutic effects. They are developed as a hemostatic agent, dermatological protector, anti-inflammatory agent and pelotherapy, or oral products as a gastrointestinal protector, antimicrobial, detoxifying or anti-diarrheal agent in health-care topical items [9-13]. Moreover, kaolin and its modified derivatives have recently been considered a

promising material in many areas of biomedical research, such as drug, protein and gene delivery, based on the high capacity of interaction with organic and biochemical molecules, bio-adhesion and cellular uptake. It can acts as an active ingredient or as adjuvant component in pharmaceutical dosage forms by controlling the efficiency and consistency in the dosage formulations and improving the drug bioavailability [14-16].

Sodium alginate (SA) is a linear polymer that has D-mannuronic acid and L-guluronic acid residues in the polymer chain, obtained from brown seaweed [17]. SA is one of the most adaptable, versatile polymers, widely used in the food, cosmetic, and pharmaceutical industries because of its properties like biocompatible, biodegradable, inherent hydrophilicity, non-toxic and good potentiality in drug delivery applications [18]. In recent decades, it is used as a potential tool for developing a different type of controlled, sustained, and targeted drug delivery systems. In addition, it is also used in the semisolid formulation and wound dressing applications [19]. Badam gum (BG) is a natural gum obtained from *Terminalia catappa* LINN, belongs to the family Combretaceae [20]. It can be used in pharmaceutical applications because of its abundant availability, reliability, efficiency, eco-friendly, and economical features. Previously Srikanth et al. [21] has reported that BG was used in controlled drug delivery systems as a retarding polymer for a highly soluble drug like propranolol HCl.

Curcumin is a natural bioactive compound derived from the *Curcuma longa* species and possesses a wide range of pharmacological properties such as antifungal, antiviral, antibacterial, anti-inflammatory, anti-malarial, antioxidant, anti-mutagenic agent, wound healing properties as well as it enhances anti-tumour activity against different types of cancer cells [22-24]. However, due to its poor water-solubility, short life and low bioavailability, the therapeutic use of CUR are limited [25, 26]. Generally, simple ionotropic gelation techniques are used to encapsulate hydrophilic drugs in hydrogel beads, but because of its poor water solubility, this technique gives low CUR encapsulation efficiency. Thus, in the present study, KA clay material was used to increase the drug encapsulation efficiency of CUR, the

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# SYNTHESIS, CHARACTERIZATION AND PHOTOCATALYTIC STUDIES OF CATION ( $\text{Ag}^{+2}$ and $\text{Sn}^{+2}$ ) DOPED $\text{Na}_{1.5}\text{Zn}_{0.75}\text{Ti}_{2.75}\text{O}_7$

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## ABSTRACT

A new type of layered titanate, i.e.  $\text{Na}_{1.5}\text{Zn}_{0.75}\text{Ti}_{2.75}\text{O}_7$  synthesized by the sol-gel method and the  $\text{Na}^+$  exchanged by  $\text{Ag}^+$  ( $\text{Ag}_{0.5}\text{Zn}_{0.75}\text{Ti}_{2.75}\text{O}_7$ ) and  $\text{Sn}^{2+}$  ( $\text{Sn}_{0.75}\text{Zn}_{0.75}\text{Ti}_{2.75}\text{O}_7$ ). The characterization of new materials  $\text{Ag}_{0.5}\text{Zn}_{0.75}\text{Ti}_{2.75}\text{O}_7$  and  $\text{Sn}_{0.75}\text{Zn}_{0.75}\text{Ti}_{2.75}\text{O}_7$  are done using PXRD, SEM, EDS, TGA, and UV-visible DRS techniques. The photocatalytic degradation studies of 4-chlorophenol and two highly toxic PAHs including anthracene (ANT) and pyrene (Py) are chosen. All the intermediates and photo-degraded products are analyzed by Mass and NMR spectral studies.

**Keywords:** Sol-gel Method, Photocatalytic Studies, EDX, PXRD, SEM, TGA, UV-visible DRS, NMR.

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## INTRODUCTION

Polycyclic aromatic hydrocarbons (PAHs) and derivatives of phenols are an essential cause of environmental pollution due to their stability in the environment and resistance to the natural degradation process.<sup>1-3</sup> They are produced through the combustion of fossil fuels, coke ovens, forest and agricultural fires, metal refining processes, and hydrocarbon production, among other processes. PAHs absorb rapidly into suspended particulates and biota, and then accumulate in soil and sediment, resulting in severe soil pollution complications.<sup>4</sup> Many of them are toxic and carcinogenic, and the US EPA lists sixteen PAHs as priority toxins.<sup>5</sup> Whereas not as active a carcinogen as benzoanthracene, anthracene is the main mutagen widespread in polluted soils.<sup>6</sup> Due to the delocalization of the electron, PAHs have a high degree of stability and limited water solubility, which results in their accumulation in food chains.<sup>7</sup> Mainly, phenols used in the polymer industry are hazardous and generate harsh environmental pollution by discharging highly toxic substances into the aqueous phase. Therefore, the degradation of PAHs and phenols is a currently focused area of research in materials chemistry.<sup>8-10</sup>

In the last two decades, one of the most challenging and costly approaches to degrading PAHs has been photocatalysis in the presence of ultraviolet light.<sup>11</sup> At present, various types of ternary oxide-based semiconductors are induced to photocatalysts effectively for the degradation of dangerous organic contaminants but very few reports about the PAH's decomposition under visible light irradiation are up to the mark. In previous studies, photocatalysts used for photo-oxidation or degradation of organic pollutants are binary oxides with a wide variety of dopants such as cations and anions.<sup>12-15</sup> The benchmark oxide among binary oxides is titanium dioxide ( $\text{TiO}_2$ ), which is widely used as a photocatalyst for the degradation of a wide range of organic contaminants when exposed to ultraviolet light irradiation due to its high bandgap energy.<sup>16,17</sup> Similarly, some other binary oxides used as photocatalysts under visible light irradiation are  $\text{BiVO}_4$ ,  $\text{TiON}$ , and  $\text{WO}_3$ . These catalysts show poor performance under visible light due to fast recombination of holes and electrons and also morphology and high bandgap energy.<sup>1,18,19</sup> As a result, the current emphasis is focused on the application of photocatalysts that operate in the presence of visible light.

The rate of cationic exchange is very fast in ternary oxides with the layered type of structural arrangement due to which they exhibit high catalytic activity.<sup>20</sup> Among these layered ternary compounds, the most desirable oxides in photocatalysis are titanates ( $\text{A}_2\text{Ti}_n\text{O}_{3n+1}$ ) due to their versatility in controlling the hole/electron mobility by inserting a wide variety of elements into the A site of the lattice.<sup>20</sup> Moreover,





## INFLUENCE OF *Beauveria bassiana* INFECTION ON RESPIRATORY AND REPRODUCTIVE PARAMETERS OF SILKWORM *Bombyx mori* L

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### AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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### ABSTRACT

The mulberry silkworm, *Bombyx mori* is highly susceptible to diseases caused by viruses, bacteria, fungi and protozoa. The most virulent and contagious disease is muscardine, which is caused by *Beauveria bassiana*. The present study is focused to understand the modulations in the oxygen consumption, fecundity, hatching percentage, unfertile eggs and dead egg percentage of silkworms i.e., in bivoltine double hybrid (CSR 2 X CSR 27 and CSR6 X CSR26) infected with *Beauveria bassiana*. The daily oxygen consumption of healthy batch showed a steady increase in the oxygen consumption from first day (0.615 ml of O<sub>2</sub>/hr/gm wet weight) to fifth day (0.827 ml of O<sub>2</sub>/hr/gm wet weight) in the control batch. It is higher on the second day (0.671 ml of O<sub>2</sub>/hr/gm wet weight) in the infected batch with gradual decline till the sixth day of the fifth instar (0.598 ml of O<sub>2</sub>/hr/gm wet weight) compared to healthy silkworms. Significant reduction in the number of eggs (595) and hatching percentage (75.8%) was recorded in inoculated silk moths compared to number of eggs laid (695) and hatching percentage (99.1%) in control. Significantly high percentage of unfertilized eggs (16.8%) and dead egg percentage (4.37%) was noticed in the experimental animals compared to unfertilized egg percentage (0.14%) and dead egg percentage (0.72%) in control. So, it is necessary to prevent the disease occurrence, especially during silkworm seed rearing to obtain quality commercial silkworm seed necessary for the progress of the industry. Therefore, there is a dire need to carry out research in basic and applied aspects to develop strategies to control the disease.

**Keywords:** *Bombyx mori*; *Beauveria bassiana*; oxygen consumption; fecundity; unfertile eggs; hatching percentage; bivoltine double hybrid.

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## Characters of cocoons of *Bombyx mori* immunized with fungal pathogen *Beauveria bassiana* (Bals.) Vuill.

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### ABSTRACT

Sericulture is a sustainable agro-based enterprise providing employment opportunities for millions of the rural and semi-urban folk, preventing migration from villages to cities in search of livelihood and alleviation of poverty. The major quantity of the silk is produced from mulberry silkworm *Bombyx mori*. The silkworm is tiny insect with a lot of economic significance; it is very sensitive and prone to different diseases such as pebrine, grasserie, flacherie and muscardine. The main constraint of the sericulture industry in India is frequent outbreak of silkworm diseases that causes cocoon crop loss. The fungal pathogen *Beauveria bassiana* (Bals.) Vuill. is one of the most harmful pathogens and highly contagious causing white muscardine disease in silkworm *Bombyx mori*. The incidence of the disease is high in rainy and winter seasons. As per Chandrasekhar and Nataraju (2008), the average cocoon crop loss due to diseases in India is to the tune of 15-47%. Out of the total cocoon crop loss, 10-40% loss is accounted for muscardine disease caused by fungal pathogen *Beauveria bassiana*. With this background the authors carried out an experiment, to understand the commercial characteristics of silk cocoons inoculated with fungal pathogen *Beauveria bassiana* compared to healthy silkworms.

**Keywords:** *Bombyx mori*, *Beauveria bassiana*, inoculation, Economic characters.

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### INTRODUCTION

India is an agriculture based country, agriculture and its allied activities are the major source of livelihood for more than 50 percent of the country's population. Sericulture can provide employment opportunities in various sectors of the industry and to heterogeneous groups of the people of the society. The entire gamut of sericulture industry comprises of many stages that begins with culturing of silkworm for the production of cocoons, the basic raw material for the production of raw silk. Around 70 percent of silk production is from mulberry silkworm and remaining 30 per cent silk production is from non-mulberry silkworms. Silkworm *Bombyx mori* is completely domesticated insect, due to continuous domestication, it has lost its wild characters; subsequently it has become susceptible to different types of diseases caused by different groups of micro-organisms. Major constraint of the sericulture industry is frequent outbreak of diseases such as Grasserie, Flacherie, Muscardine and Pebrine caused by viral, bacterial, fungal and protozoan microorganisms that affect the cocoon crops and cause huge loss to the sericulture farmers. Among these diseases, white muscardine caused by *Beauveria bassiana* is the most common one occurring during rainy and winter seasons in India, low humidity and low temperature favour the multiplication and spread of the fungal disease. Fast multiplication and fast spread are the main characteristic features of the *Beauveria bassiana* and white muscardine develops into an epizootic within no time if the conditions are congenial. Bassi [3] revealed the infectious nature of the disease and identified the fungal causative agent and recommended the appropriate measures for prevention of the fungal disease i.e., muscardine Ainsworth [1]. The recurrent occurrence of diseases is one of the major problem for the development of the sericulture industry. Janakiraman [6], Ayuzawa [2], Chandrasekharan and Nataraju [3] reported that 10-40 percent silkworm cocoon crop loss is due to the fungal disease caused by the pathological agent *Beauveria bassiana*. Therefore, the study was carried out to realize the

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# Internalization and induction of defense responses in tobacco by harpin<sub>PS</sub> conjugated gold nanoparticles as a foliar spray

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nanoparticles (H-CAuNP)

Hypersensitive response (HR)

Immunogold labeling

Fluorescent labeling

## ABSTRACT

Controlled and targeted delivery of elicitor molecules with improved bioavailability is required to treat plant diseases. Here we reported stable, reproducible, and nano-sized (20–22 nm) negatively (H-AuNP) and positively (H-CAuNP) charged harpins adsorbed nanoparticles to induce defense responses in tobacco. The foliar application of NPs facilitated their entry possibly through epidermal stomata accumulated in the apoplast and symplast eliciting the hypersensitive response (HR) with the up-regulation of pathogenesis-related gene transcripts (PR-1, PR-2, PR-3, chitinase, HR203, and HR specific marker gene 'HIN1') in 6 h. Immunogold labeling of harpin<sub>PS</sub> revealed its internalization (symplast & apoplast) and correlated with the induction of defense responses. Studies with fluorescently labeled NPs demonstrated the uptake and distribution within the leaf. Transmission electron microscopy observations revealed the internalization of H-CAuNP and long-distance transport, eliciting systemic acquired resistance. Our observation holds promise in effectively minimizing the concentration of harpin for field application.

## 1. Introduction

The application of agrochemicals to combat plant diseases ends up damaging the environment and leading to degradation of soils and 99.9% of applied pesticides are wasted by not reaching the targets [1]. One alternative approach is to elicit systemic acquired resistance (SAR) in plants by elicitor molecules, which not only boosts plants innate immunity besides reducing the usage of hazardous chemicals. The active components that are degraded before reaching the target is the major constraint in agro-formulations. Greater efficiency could be achieved by nanomaterials as a foliar application but plant cell wall acts as a mechanical barrier avoiding the entry of external agents including nanoparticles into plant cells. The exclusion limit of the cell wall facilitating only 5 to 20 nm particles to enter into the vicinity of the cellular environment [2]. Nanoparticles of appropriate size and composition could easily pass through and reach the cell membrane [3,4]. Engineered nanoparticles can increase the size of pores and can induce the formation of new cell pores in turn enhancing the nanoparticles uptake. Nanoparticles when applied as a foliar spray enters through the epidermal openings or the trichomes and are translocated to various parts of the cell [5–7]. Targeted delivery of elicitor molecules through

nanoparticles increases the chances of absorption and minimizes the concentration of the biological macromolecules for field application.

Harpins are glycine-rich, protease insensitive, thermostable proteinaceous elicitors secreted by gram-negative plant pathogenic bacteria that trigger plant defense reactions by interacting with wall-associated proteins [8]. Harpin, virtually non-toxic to humans was cleared by the US Environment Protection Agency (EPA) for application in commercial agriculture in the name of 'messenger' [9]. Harpin sprayed onto the foliage is recognized by plant receptors located in cell walls and a systemic signal is passed through the whole plant that boosts the plants natural ability to protect itself through the defense system [10]. Infiltration of harpin<sub>PS</sub> from *Pseudomonas syringae* pv. *syringae* into intercellular spaces of plant cells in non-host tobacco plants elicited the hypersensitive response (HR) [11]. The HR is a complex defense response, a resemblance of programmed cell death in plants that results in the oxidative burst, accumulation of several defense proteins including pathogenesis-related (PR) proteins, deposition of callose and lignin in the infection site [12,13].

Foliar application of harpin could be an alternative to the use of conventional ecologically hazardous chemicals for the control of plant diseases. Harpin-like proteinaceous elicitors induce systemic acquired

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## Antioxidant activity evaluation of *Memecylon lushingtoni* Fruit

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**Abstract:** In the present study evaluation of *Memecylon lushingtoni* fruit pulp (M.L.Fr.) Aqueous extract has been quantified for antioxidant activity. Total phenolic content (TPC), total flavonoid content (TFC) was evaluated and tested for its antiradical scavenging activity by DPPH and ABTS assays using standard photometric methods. M.L.Fr. exhibited prominent values for TPC, TFC and *in-vitro* radical scavenging activity. Our findings concluded that ripe fruits of *Memecylon lushingtoni* contain an appreciable amount of high valued therapeutic compounds and could act as a potential source of natural antioxidants.

**Keywords:** *Memecylon lushingtoni*, Antioxidant activity, Horsley hills.

### Introduction

Antioxidants play a key role in protecting against oxidative damage. Plant extracts has a great potency in playing as natural antioxidants (Edziri *et al.*, 2020). Fruits are vital dietetic components containing various bioactive constituents which have been established to be useful to control and treat various persistent diseases like diabetes, obesity, cancer and cardiovascular diseases (Devalaraja *et al.*, 2011).

Our extensive field survey and enlisting of wild edible plants of seshachalam hills revealed few unexplored plant species where no data is available on its biological compounds (Ganesh and Sudarsanam, 2013; Anjaneyulu and Sudarsanam, 2013). One among the unexplored is *Memecylon lushingtoni*, a rare species which is very closely related to *Memecylon umbellatum* and can be differentiated in flowering and fruiting stage only. *Memecylon lushingtoni* fruits are edible and were swallowed by fauna like birds, squirrels. However, no ethnic information was reported on phytochemistry nor on antioxidant property of this taxon which is lacking and so far not been investigated to the best of our knowledge. In view of exploring of unexplored we intended to investigate the antioxidant potency of *Memecylon lushingtoni* ripe fruits.



Figure. 1. *Memecylon lushingtoni*  
1A. Immature and Mature fruits.  
1B. Ripe fruits.

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## Phytochemical Screening And Nutritional Evaluation Of *Ficus Tsjakela* Figs

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### ABSTRACT

In this study, *Ficus tsjakela* figs were assessed for phytochemical and nutritional contents. The presented results displayed that the figs of *F. tsjakela* contains wide variety of phytoconstituents and appreciable level of nutritional attributes emphasizing high valued therapeutic potential which can be as a promising natural nutraceutical agent and can act as a substitute to the synthetic counterparts.

**Keywords :** *Ficus tsjakela*, proximate analysis, nutritional composition, phytochemical screening.

### INTRODUCTION

Plant nutraceuticals chiefly allied with the content of several phytochemicals, predominantly nutritive factors, antioxidants and dietary fiber present in the plant products has been receiving recognition globally due to potential remedy against various chronic diseases and disorders (Pandey *et al.*, 2011; Nasri *et al.*, 2014; Madhurantakam *et al.*, 2018; Taroncher *et al.*, 2021; Pemmaraju *et al.*, 2022 Maurya *et al.*, 2021).

*Ficus tsjakela* Burm.f., (Moraceae) deciduous tree native to Peninsular India bear figs where Frugivore dependence is more. Many animals, Aves, mammals, Insecta, Reptilia depend on the figs of *Ficus tsjakela* for their diet (Sreekar, 2011). It was reported that Greater Golden-backed Woodpecker *Chrysocolaptes lucidus* feed on figs of *Ficus tsjakela* in its supplementary diet (Sreekar, 2011). This interesting aspect intended to take up the investigation on phytochemicals and dietary supplements of the figs of *Ficus tsjakela*.

Recently, Thumaraikani *et al.*, (2021) proved that fruits of *F. tsjakela* possess antioxidants and antimicrobial activity. The clinical signs resembled to neurotoxicity, Hematobiochemical, pathomorphological of Leaf of *F. tsjakela* was well studied on Livestock (Shridhar *et al.*, 2014; Shridhar 2017 & 2020). Babu *et al.*, (2012) described the *Ficus* species in India. Sudhakar *et al.*, (2017) documented figs of eastern ghats and Reddy *et al.*, (2020) studied the diversity and distribution of *Ficus* species of Andhra Pradesh.

The main purpose of this investigation is to evaluate the phytochemical constituents, proximate and mineral composition due to the paucity of information on *Ficus tsjakela* figs.

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